

MEMOIR No. 38

NORTH AMERICAN CORDILLERA

FORTY-NINTH PARALLEL

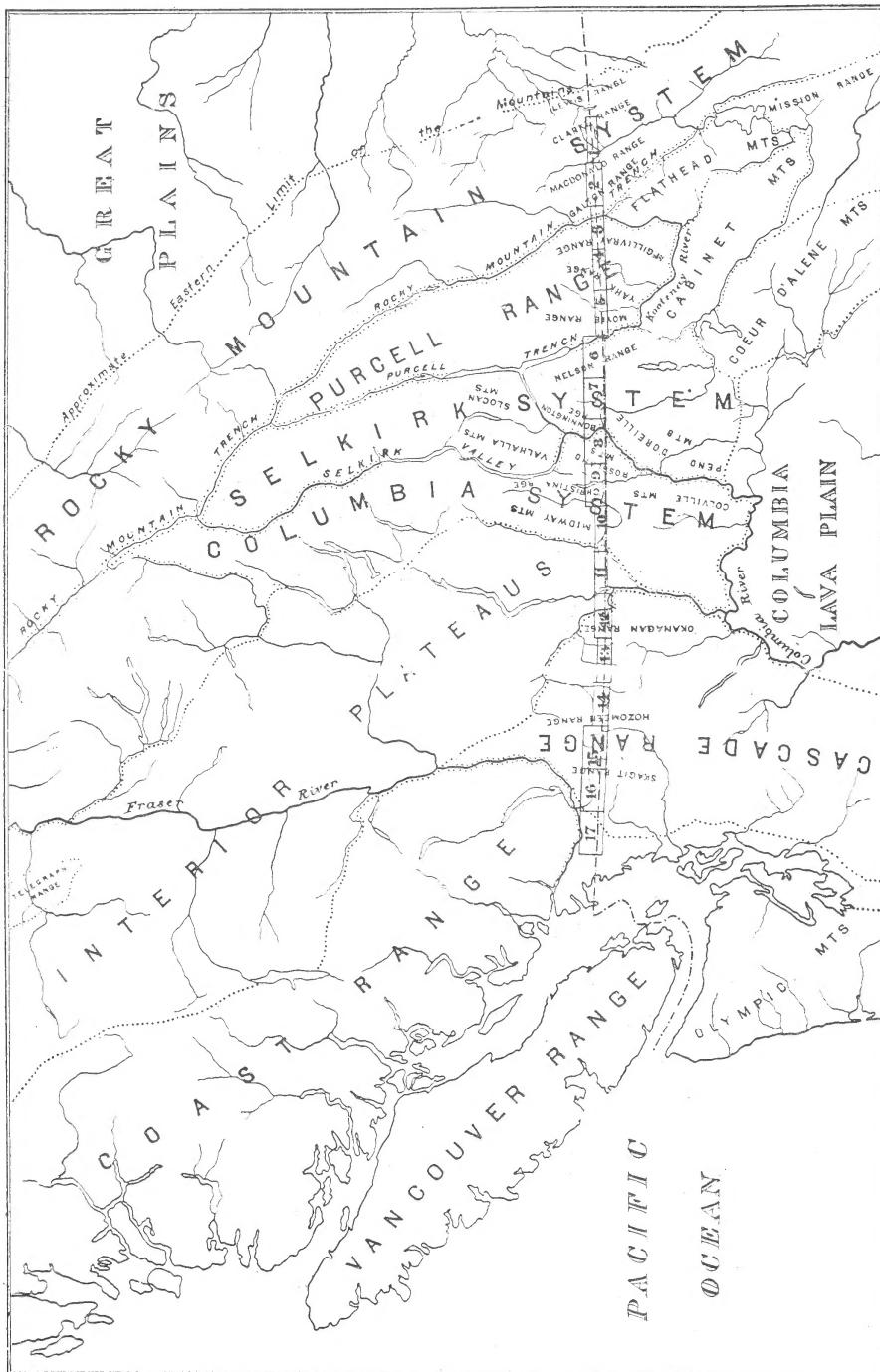
BY

REGINALD ALDWORTH DALY

PART III

THE
GEOLOGICAL SURVEY
DEPARTMENT OF MINES
OTTAWA
1912

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KEY SHOWING POSITION OF SHEETS.

QE
71
D15
Atlas

Reginald Aldworth Daly
Geology of the North American cordillera at the
forty-ninth parallel



Sheet 1—Clarke Range
“ 2—Galton Range.
“ 3—Rocky Mountain Trench.
“ 4—Yahk Range
“ 5—Moyie Range.
“ 6—Purcell Trench.
“ 7—Pend D'Oreille R.ver.
“ 8 - Rossland Mountains.
“ 9—Christina Lake.
Sheet 10—Midway Mountains,
“ 11—Osoyoos Lake.
“ 12—Kruger Mountain.
“ 13—Okanagan Range.
“ 14—Hozomeen Range.
“ 15—Skagit Range.
“ 16—Chilliwack River.
“ 17—Sumas Lake.

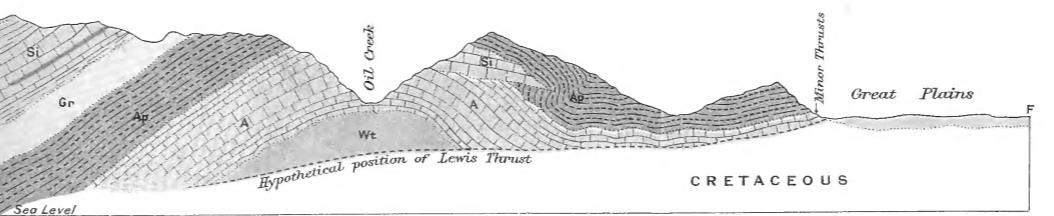
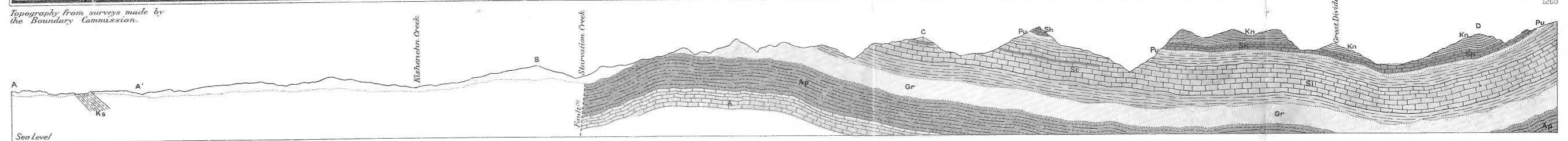
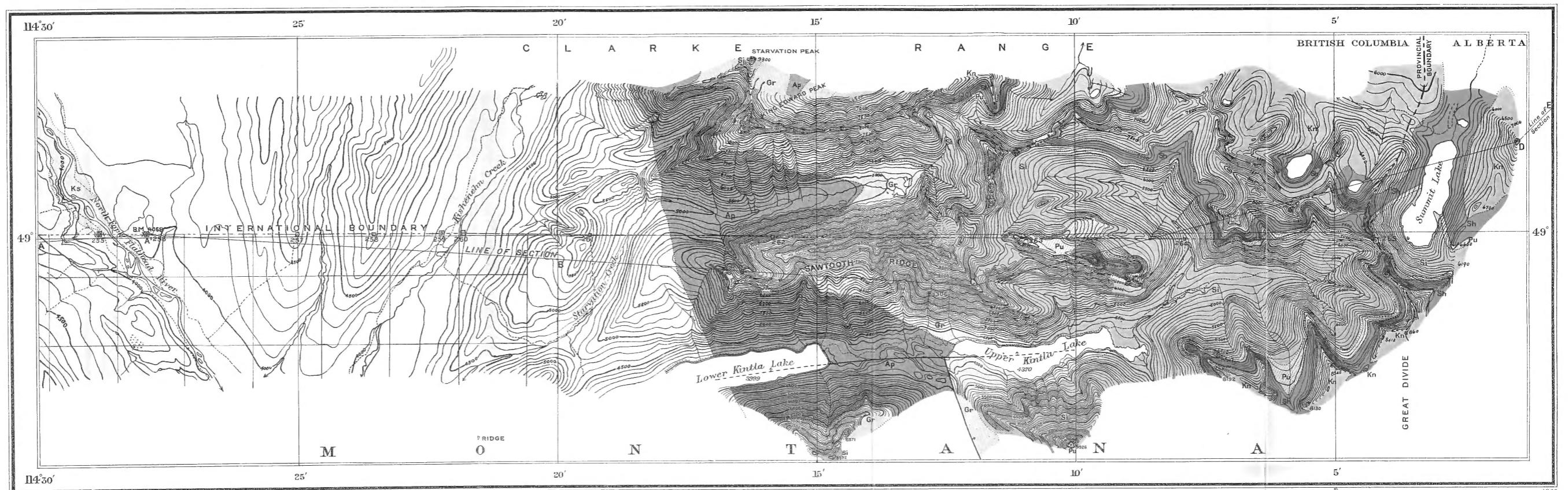
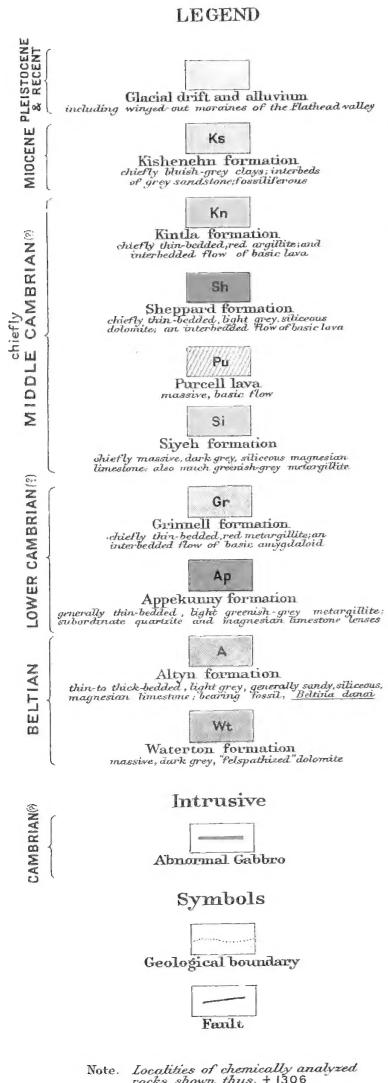
Plate 72—Views of the Rocky and Selkirk Ranges.
“ 73—Views of the Selkirk, Columbia and Cascade Ranges.
—Erratum Sheet.



ERRATA

Boundary Monument 255 should read 261
" " 256 " 262
" " 257 " 263
" " 258 " 264
" " 259 " 265
" " 260 " 266
" " 261 " 267
" " 262 " 268
" " 269 is 0.04 miles west of Mon. 270
" " 263 should read 270
" " 264 " 271
" " 265 " 272
" " 273 is 1.16 miles east of Mon. 272





GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

Scale: $\frac{1}{62500} = 0.9864$ Statute Miles to 1 Inch
Miles

Contour interval, 100 feet

MAP 74 A
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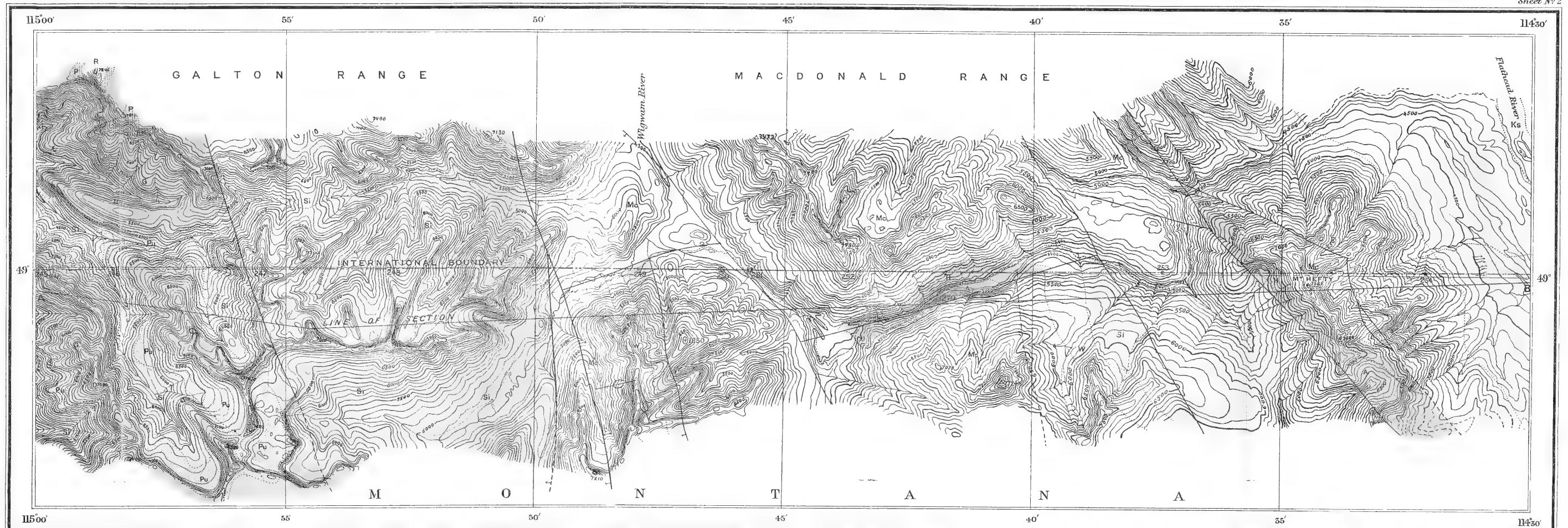
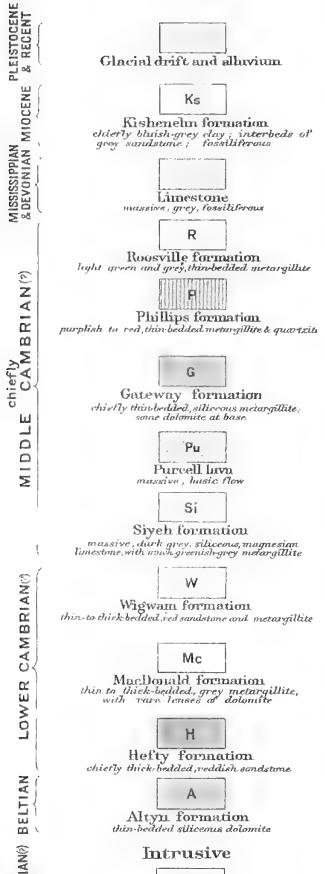


ERRATA

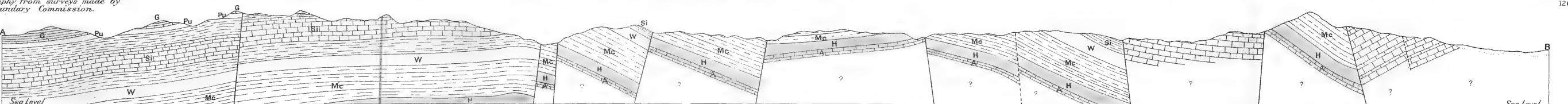
Boundary Monument 245 should read 248
" " 246 " 249
" " 247 " 250
" " 248 " 25
" " 252 is 1.35 miles east of Mon. 251
" " 249 should read 253
" " 250 " 254
" " 251 " 255
" " 252 " 256
" " 257 is 2.59 miles east of Mon. 256
" " 253 should read 258
" " 259 is 2.14 miles east of Mon. 258
" " 254 should read 260



LEGEND



*Topography from surveys made by
the Boundary Commission.*



Note. Localities of chemically analyzed rocks, shown thus, +1250

GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

Scale: $\frac{1}{62500} = 0.9864$ Statute Miles to 1 Inch

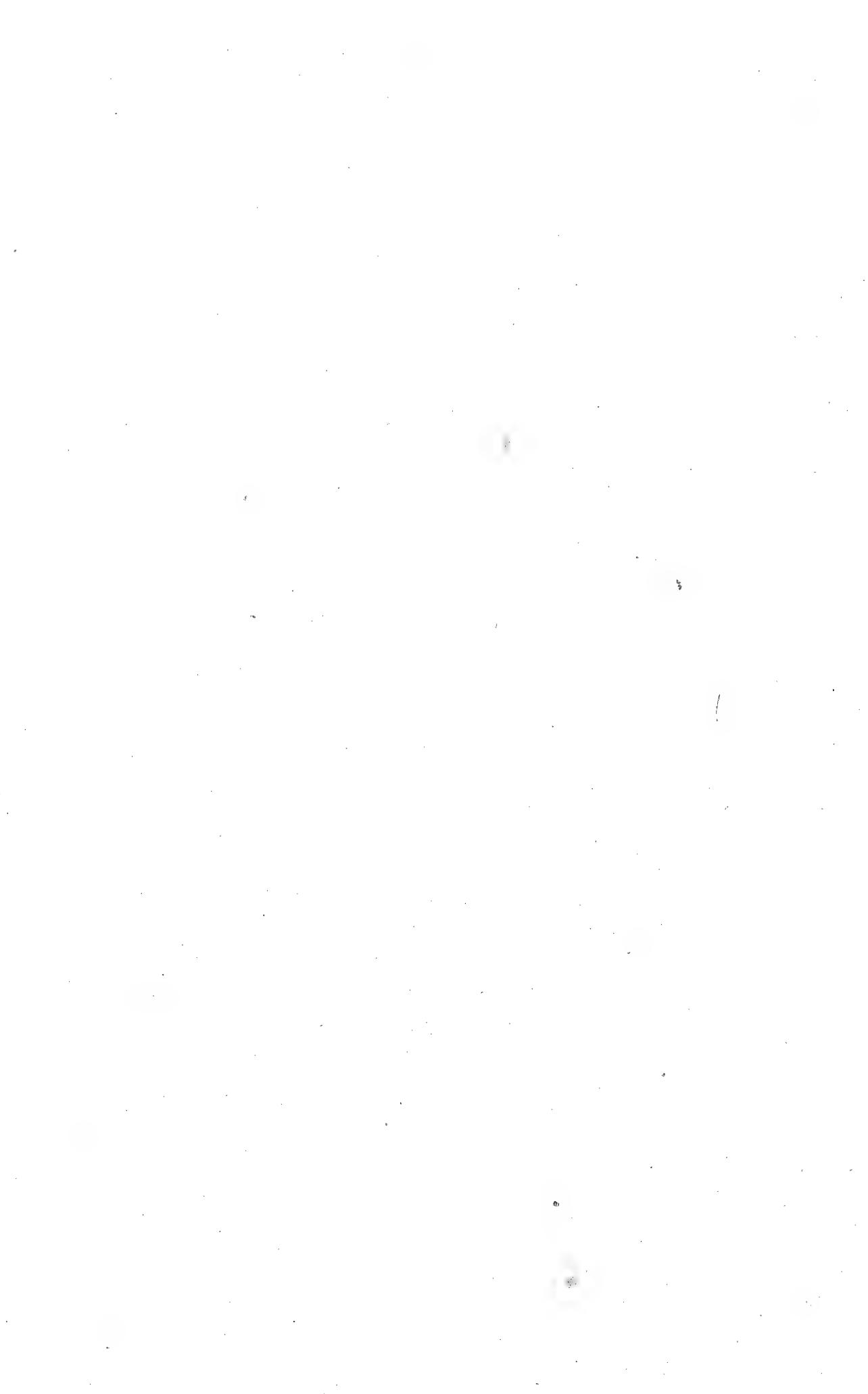
Miles

A horizontal number line with tick marks at $\frac{1}{2}$, 0, 1, 2, 3, and 4. The line is divided into 4 equal segments by the tick marks, with the first segment being labeled $\frac{1}{2}$.

contour interval 100 feet

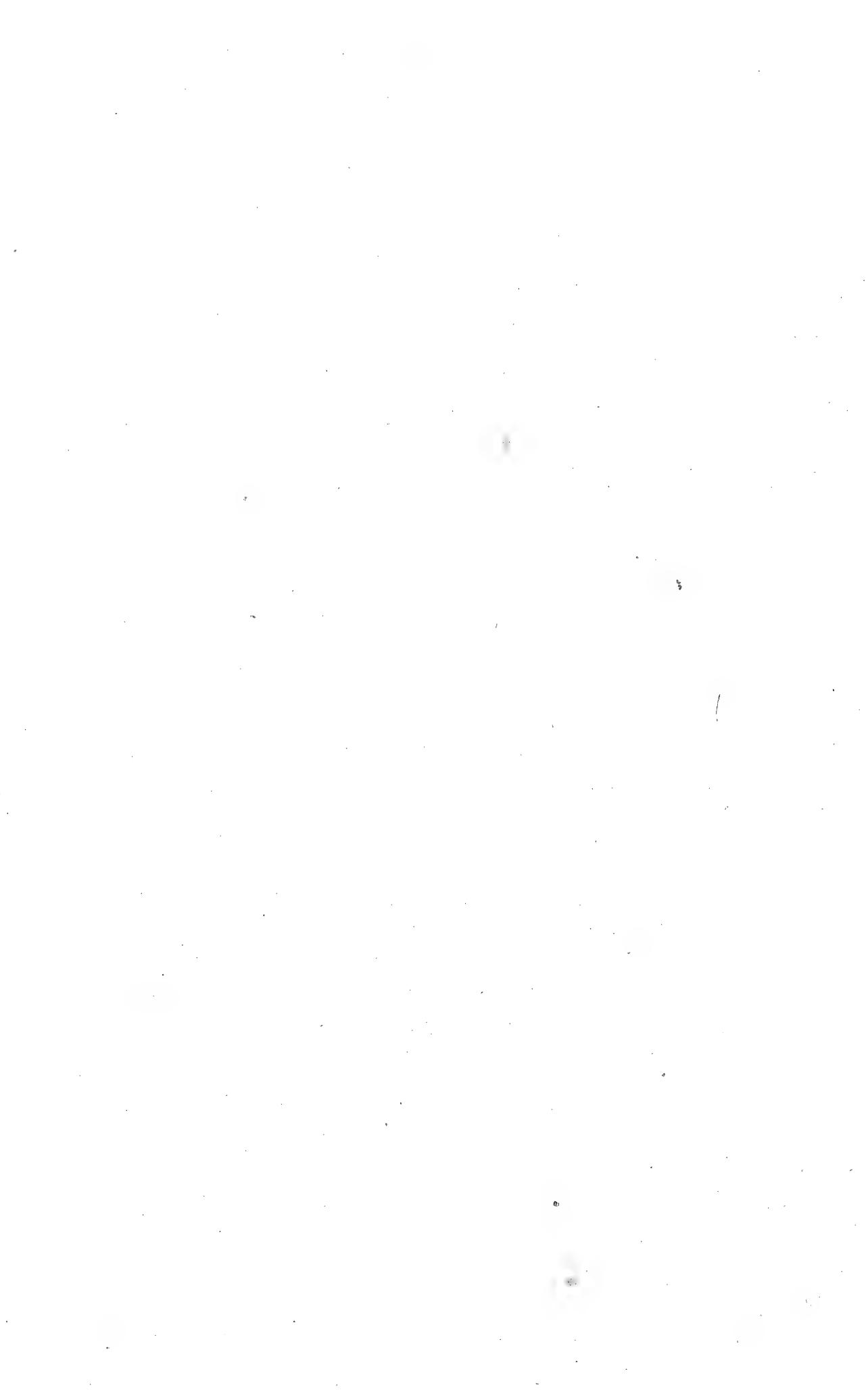
MAP 75 A

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ERRATA

Boundary Monument 235 should read 237
" 236 " 238
" 237 " 239
" 238 " 240
" 239 " 241
" 240 " 242
" 241 " 243
" 244 is 0.22 miles west of Mon. 245
" 242 should read 245
" 243 " 246
" 244 " 247
" 245 "



LOWER CAMBRIAN (G) MIDDLE CAMBRIAN (G) CHIEFLY MIDDLE CAMBRIAN (G) PLEISTOCENE & RECENT

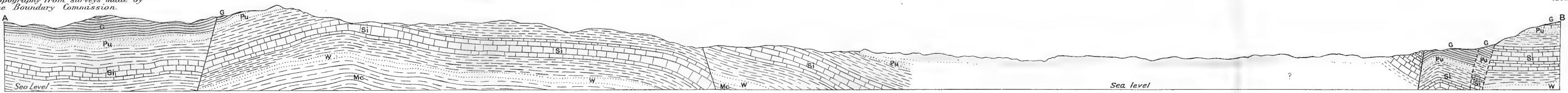
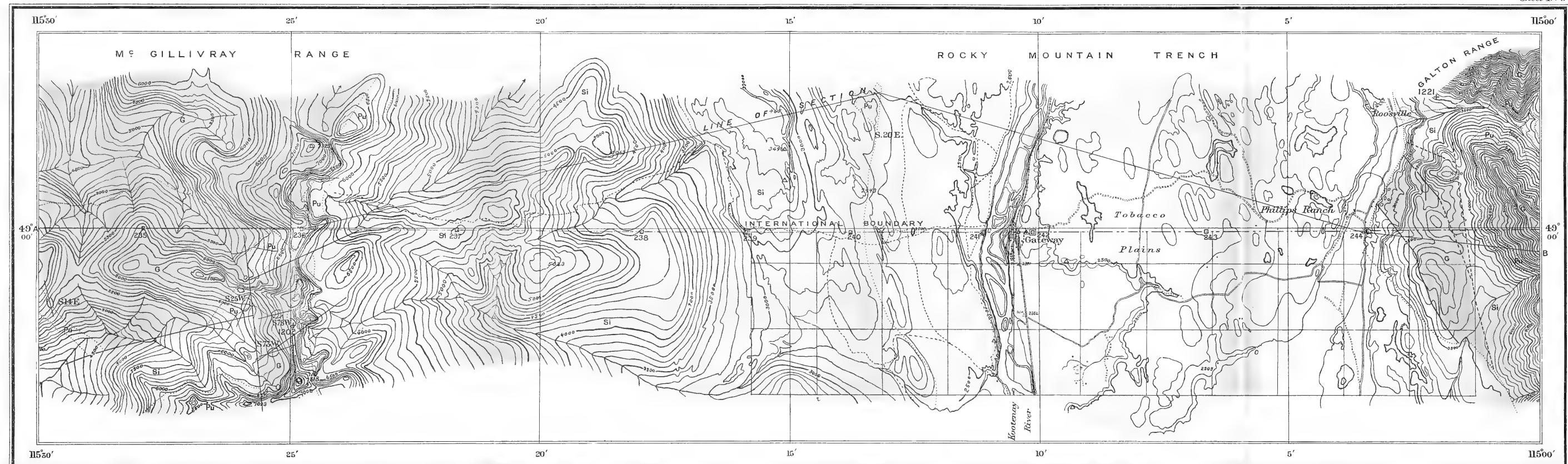
LEGEND

- [Box] Glacial drift and alluvium
- [Box] Limestone and quartzite massive, limestone fossiliferous
- [Box] G Gazeaway formation, thick-to-thin bedded, siliceous metargillite, some dolomite at base
- [Box] Pu Purcell lava massive, basic flows
- [Box] Si Sich formation thin-to-thick bedded, greenish grey metargillite, siliceous, magnesian limestone
- [Box] W Wigwan formation thin-to-thick bedded, red sandstone and metargillite
- [Box] Mc Mac Donald formation thin-to-thick bedded, grey metargillite

Symbols

- [Dotted line] Geological boundary
- [Dashed line] Fault
- [Arrow] Glacial striae

Note. Localities of chemically analyzed rocks, shown thus, +1202



GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A. Daly.

Scale: $\frac{1}{62500} = 0.9864$ Statute Miles to 1 Inch

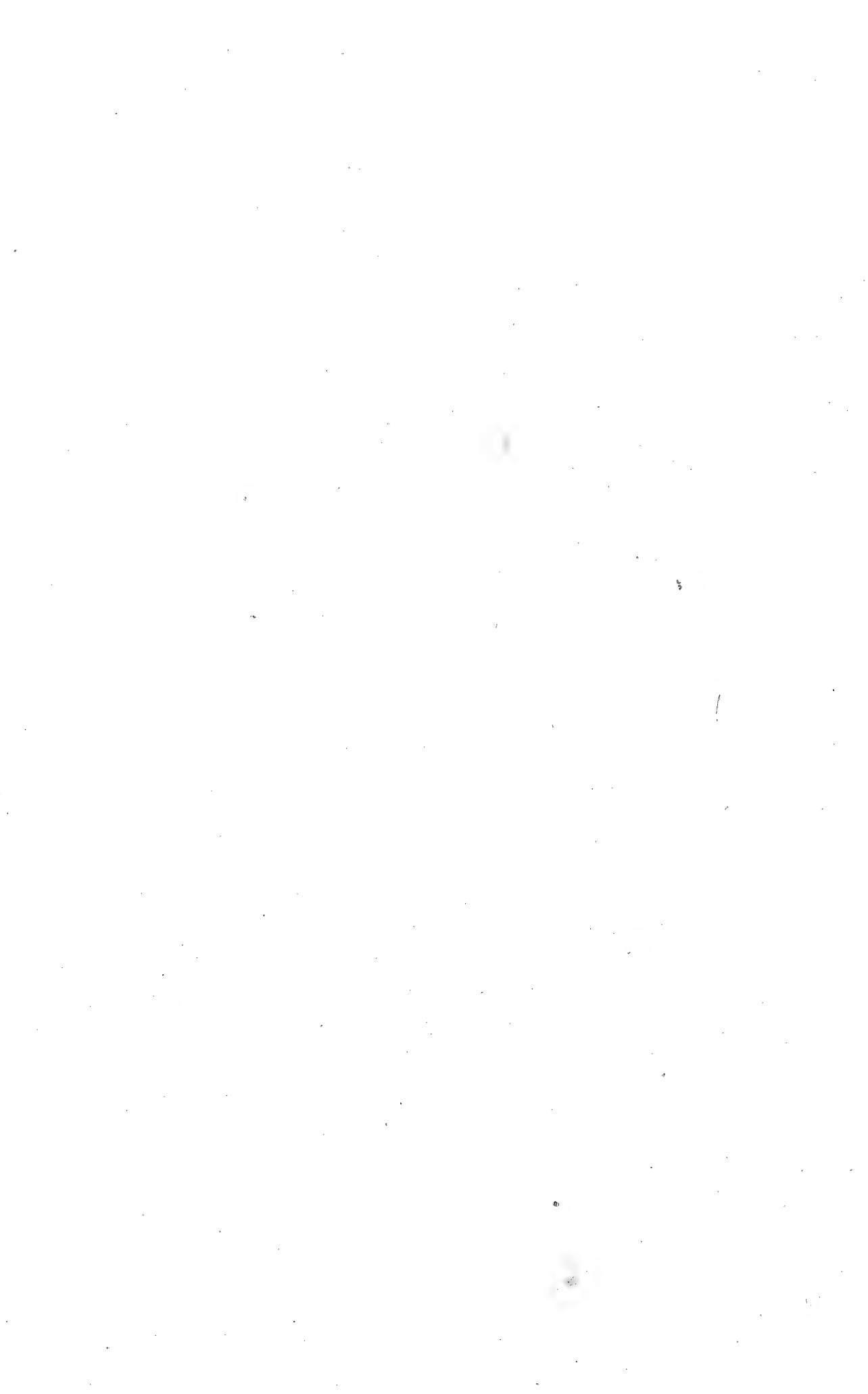
Miles

1 1/2 0 1 2 3 4

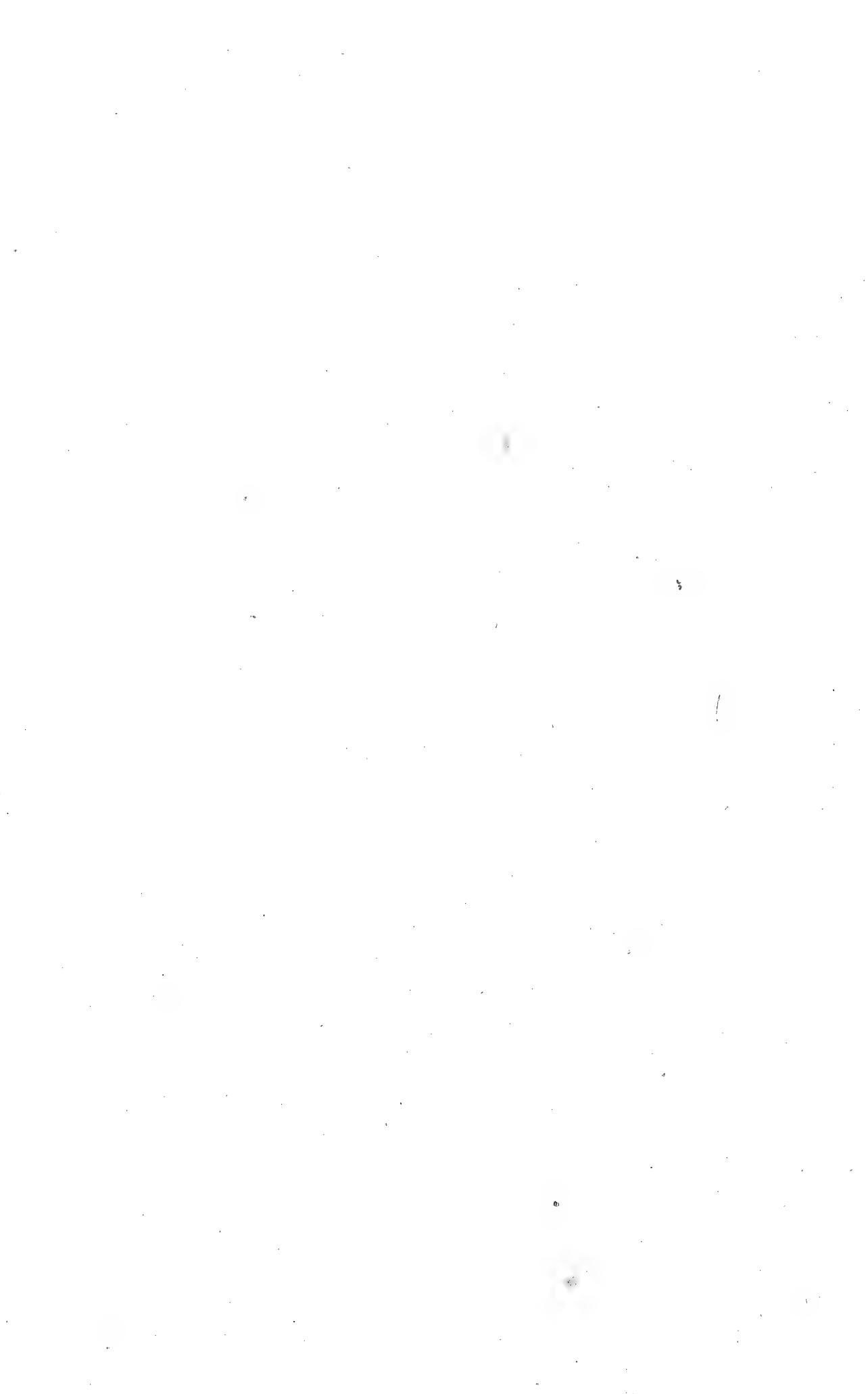
Contour interval, 100 feet

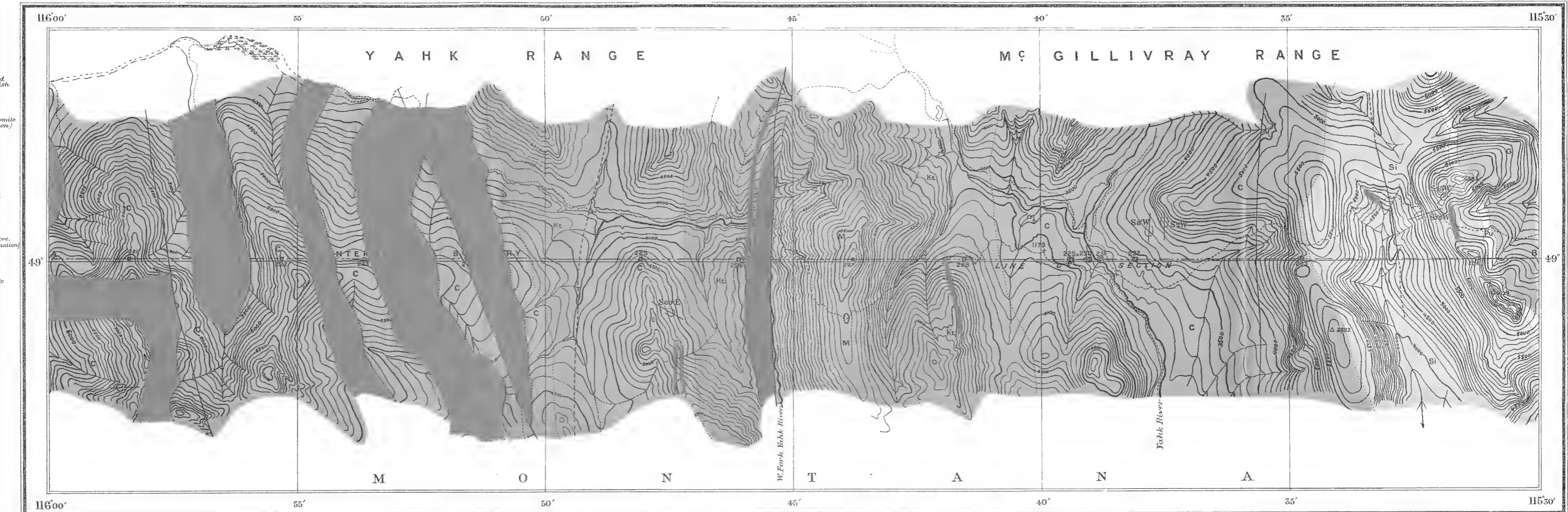
MAP 76A

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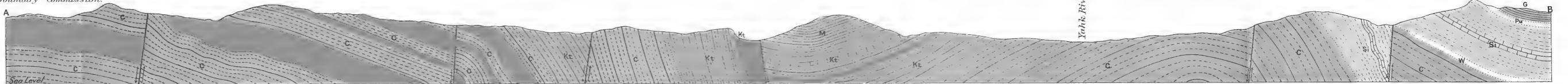


ERRATA	
Boundary Monument 221	should read 223
" "	222 "
" "	223 "
" "	224 "
" "	225 "
" "	226 "
" "	227 "
" "	228 "
" "	229 "
" "	230 "
" "	231 "
" "	232 "
" "	233 "
" "	234 "
" "	235 "
" "	236 "





Topography from surveys made by the Boundary Commission



GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

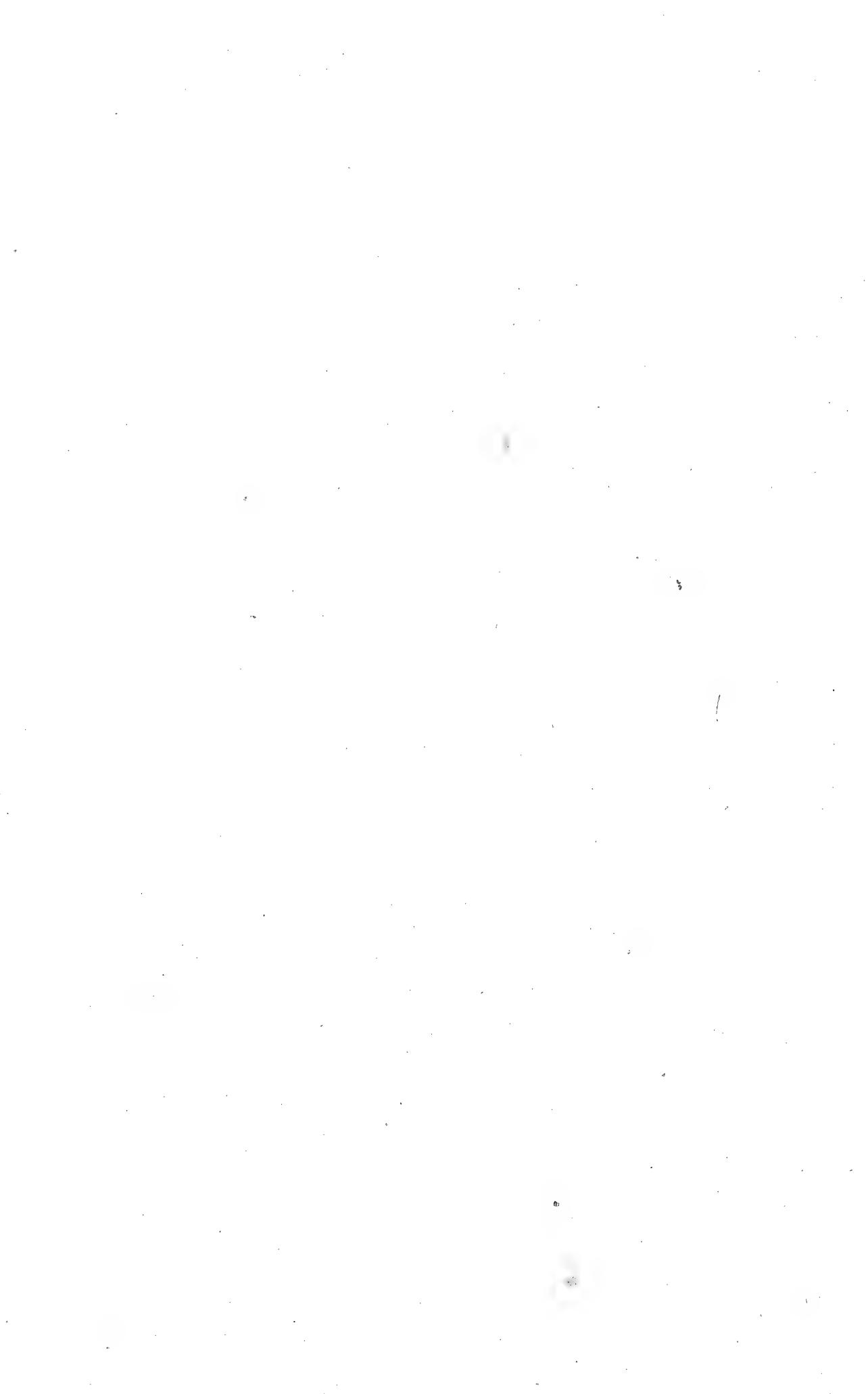
Scale: $\frac{1}{22500}$ - 0.9864 Statute Miles to 1 inch

1 $\frac{1}{2}$ 0 1 2 3 4 Miles

Contour interval, 100 feet

MAP 77A

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ERRATA

Boundary Monument 207 is 2.72 miles west of Mon. 208
" 207 should read 208
" 208 " " 209
" 209 " " 210
" 210 " " 211
" 211 " " 212
" 212 " " 213
" 213 " " 214
" 214 " " 215
" 215 " " 216
" 216 " " 217
" 217 is 0.02 miles east of Mon. 217
" 217 should read 219
" 218 " " 220
" 219 " " 221
" 220 " " 222





Movie formation

Kt

C
Creston formation.
*massive to thin-bedded, grey quartzite
 and subordinate metarnallite*

Intrusive

Abnormal hornblende gabbro

Symbols

Ecological boundary

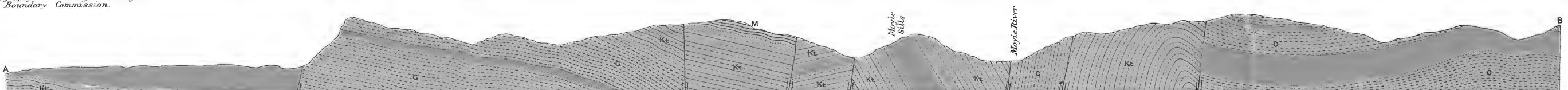
— 1 —

Fault

Glacial striae

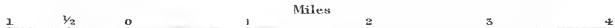
Note. Localities of chemically analyzed rocks shown thus. † 134

*Topography from surveys made by
the Boundary Commission.*

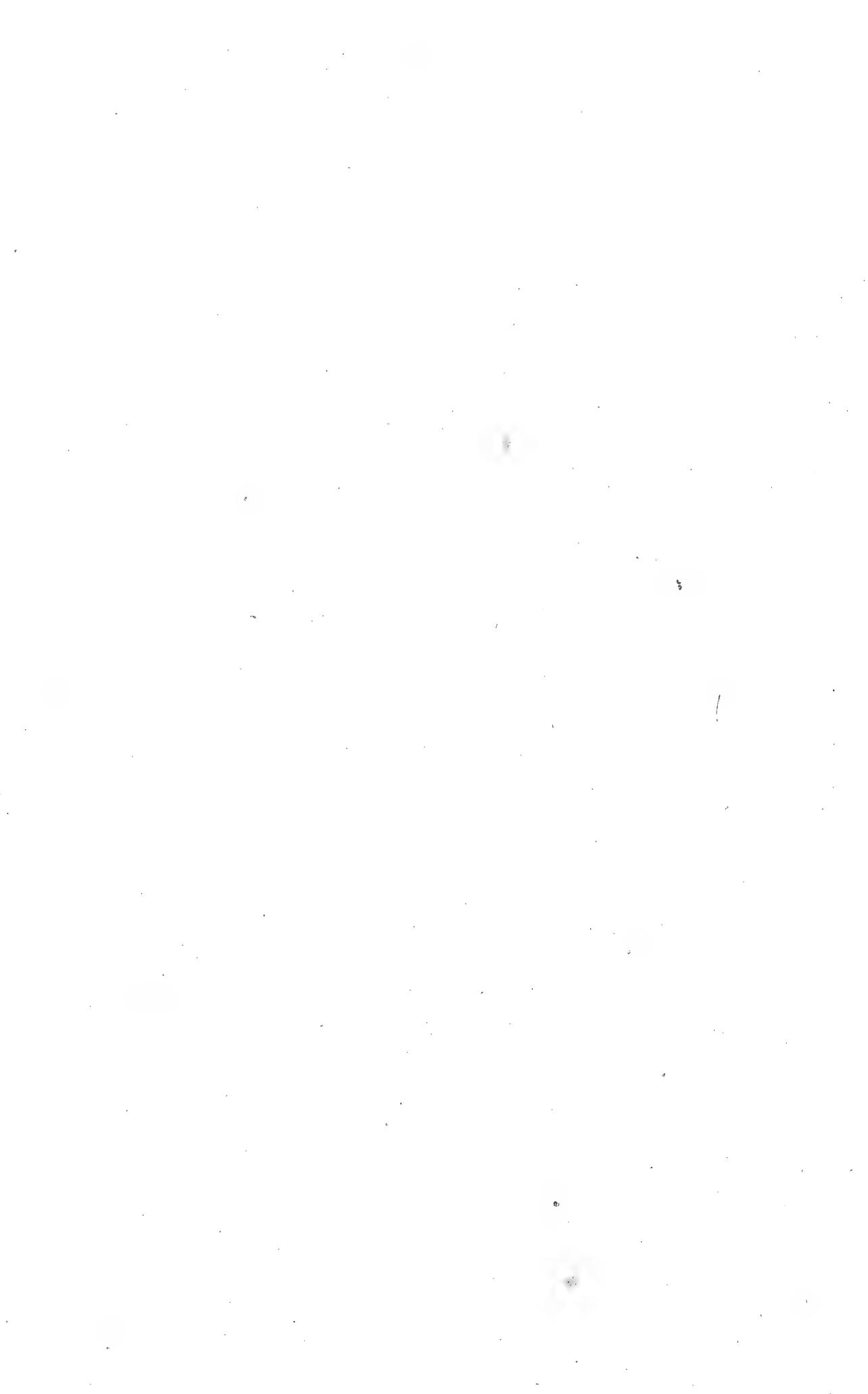


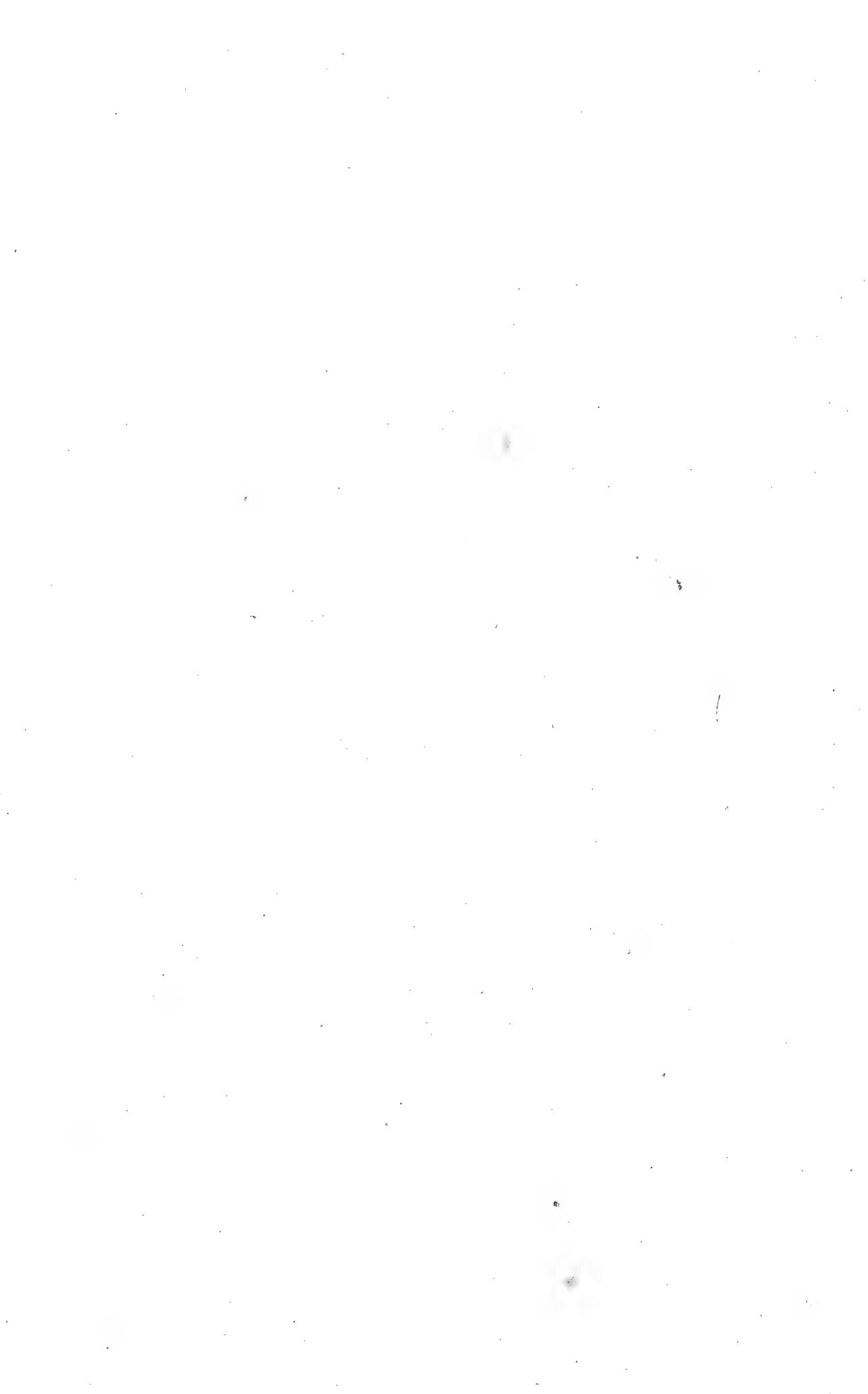
GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

Scale $\frac{1}{62500} = 0.9864$ Statute Miles to 1 Inch



Contours interval 100 feet





LOWER CAMBRIAN Chiefly

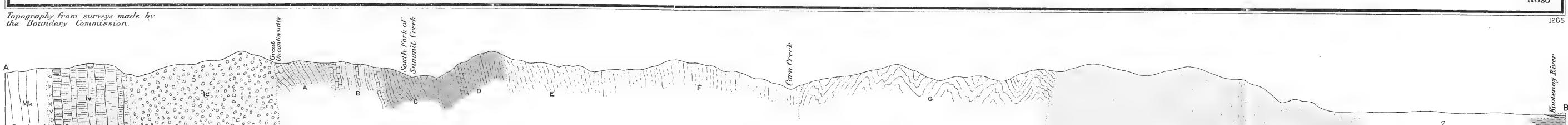
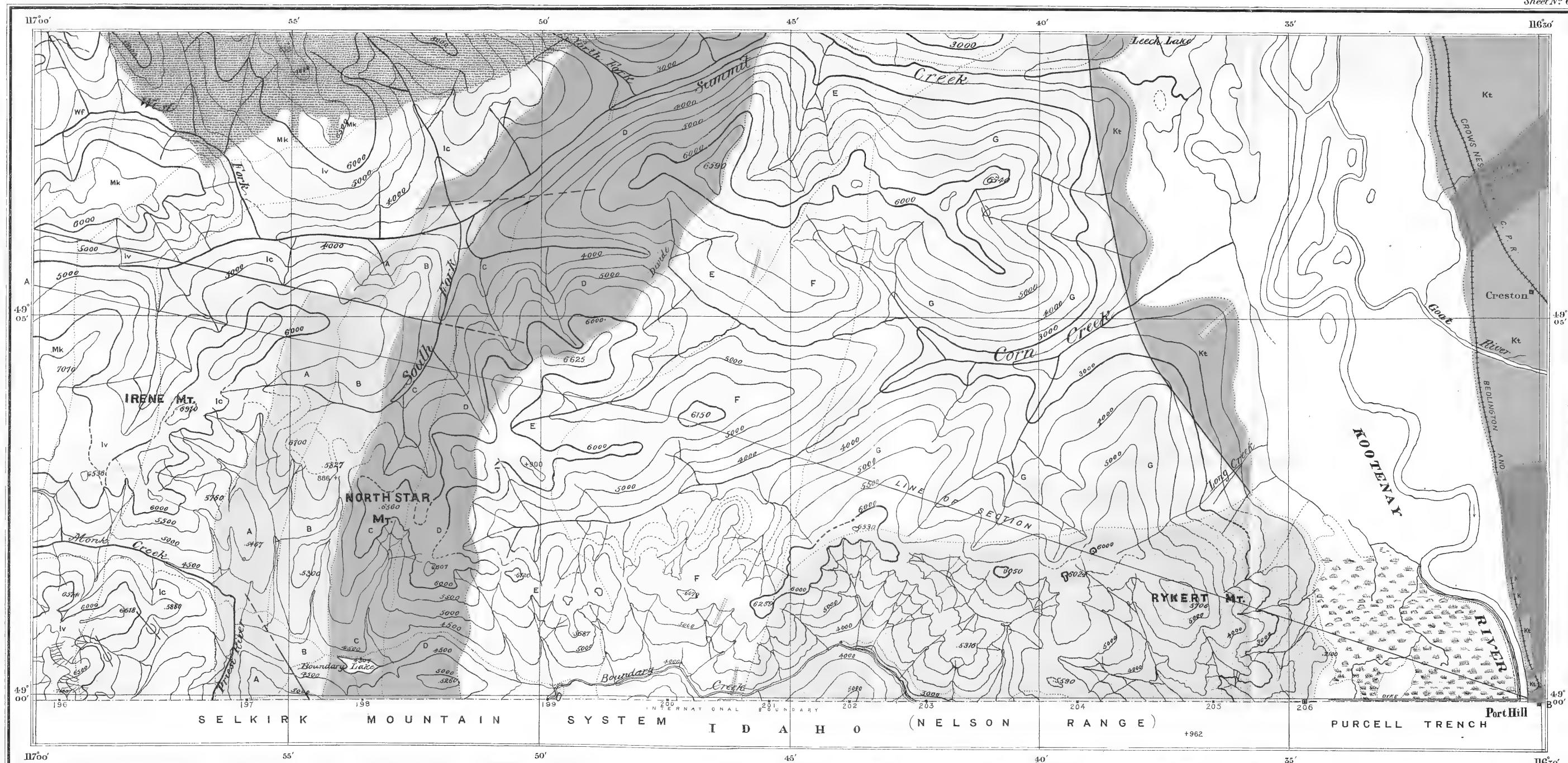
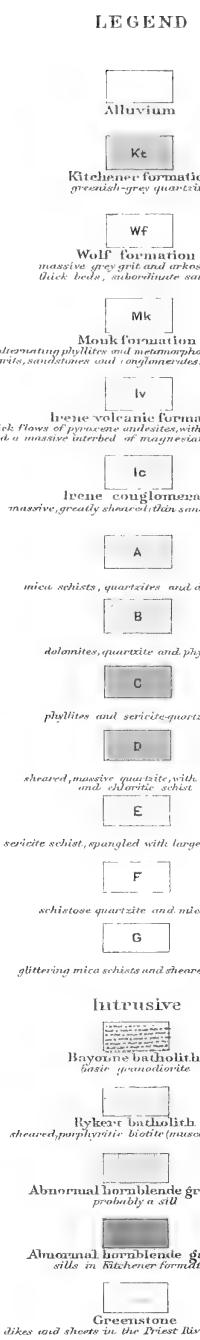
& BELTIAN MID-CAMBRIAN RECENT

BELTIAN

PRE-BELTIAN PRIEST RIVER TERRANE

CAMBRIAN

JURASSIC TERTIARY



Note. Structure of Pre-Beltian series shown on section, merely diagrammatic.
Localities of chemically analyzed rocks, shown thus, +900

GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

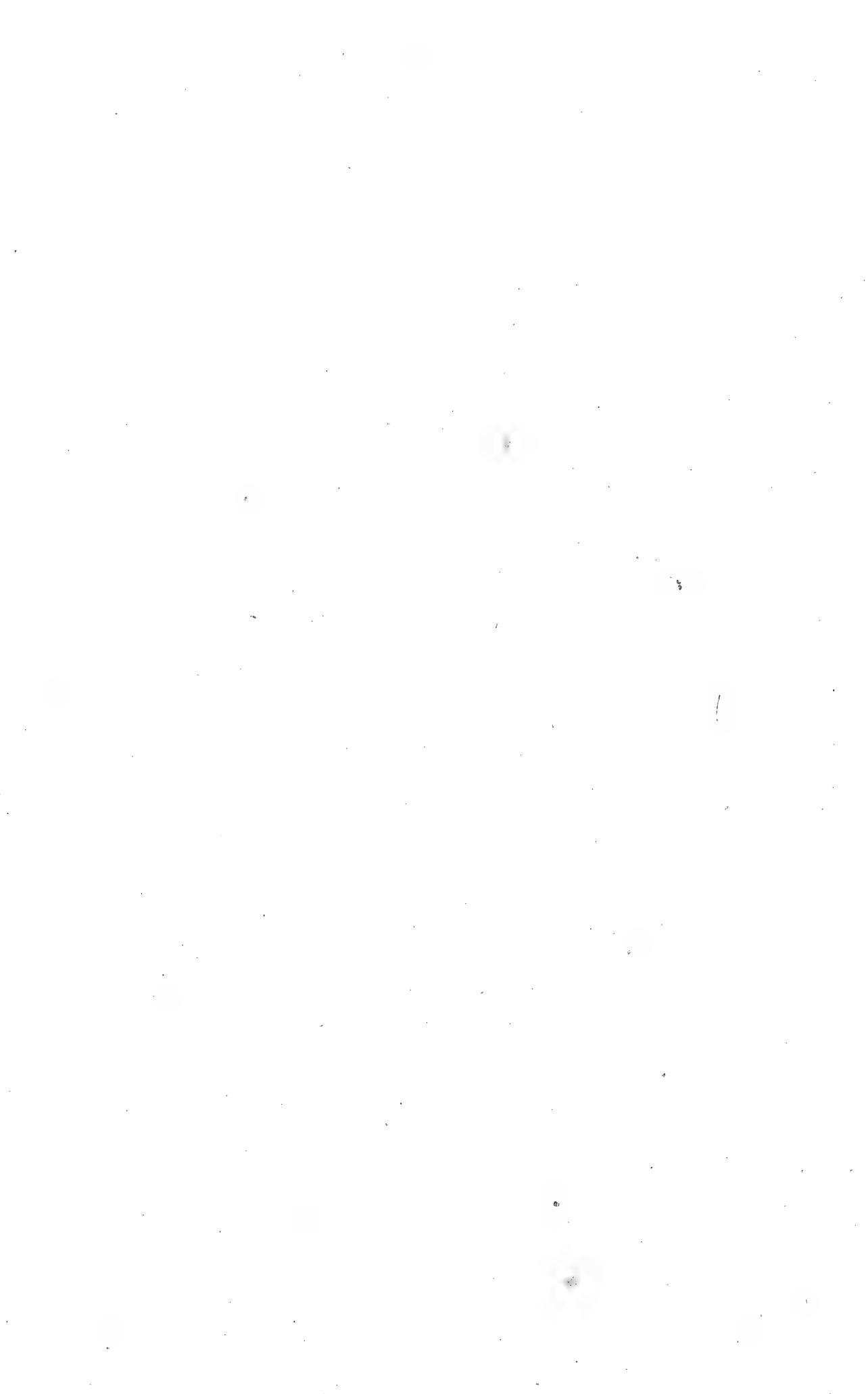
Scale: 62500 - 0.9864 Statute Miles to 1 Inch

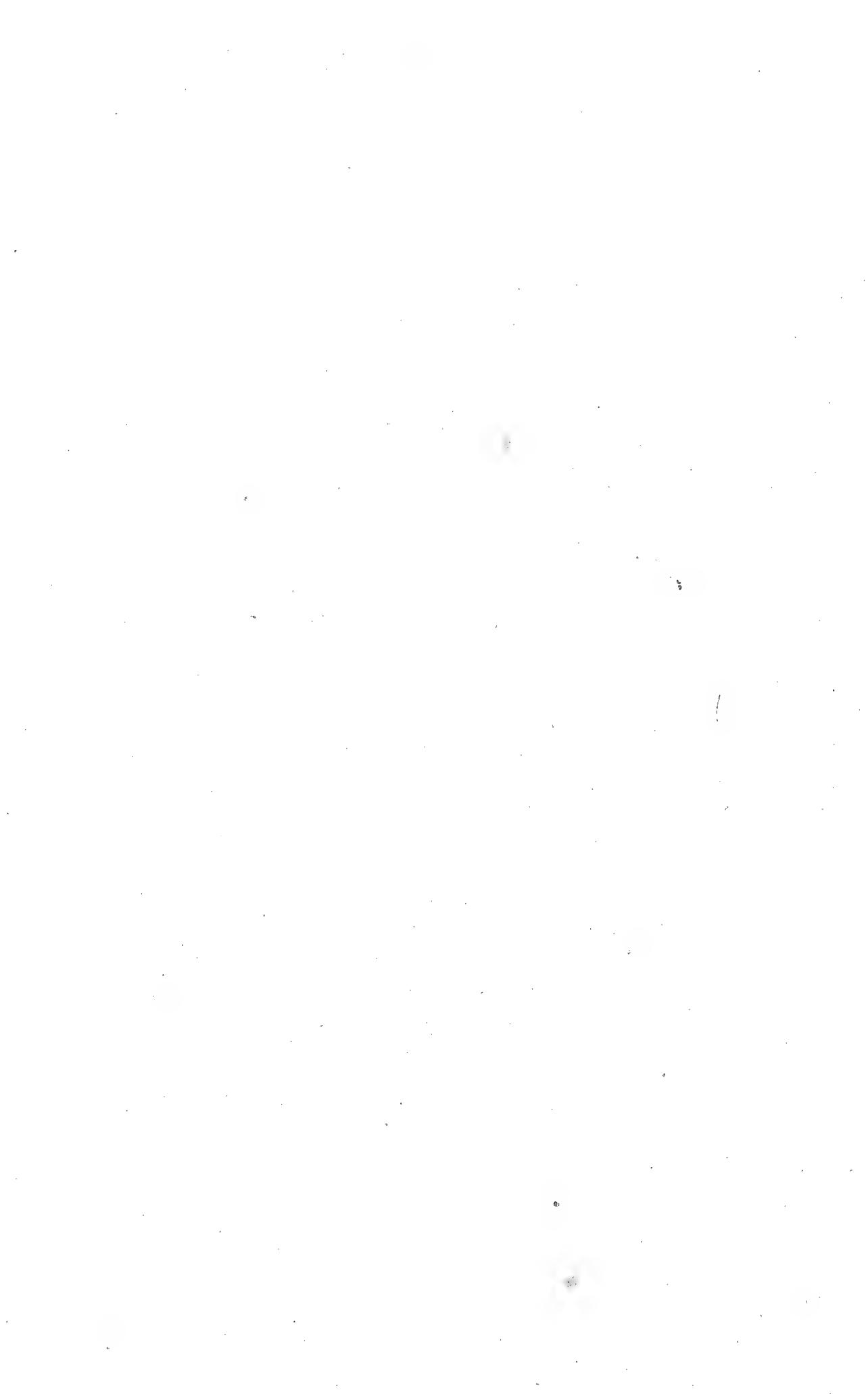
1 1/2 0 1 Miles 2 3 4

Contour interval, 500 feet

MAP 79A

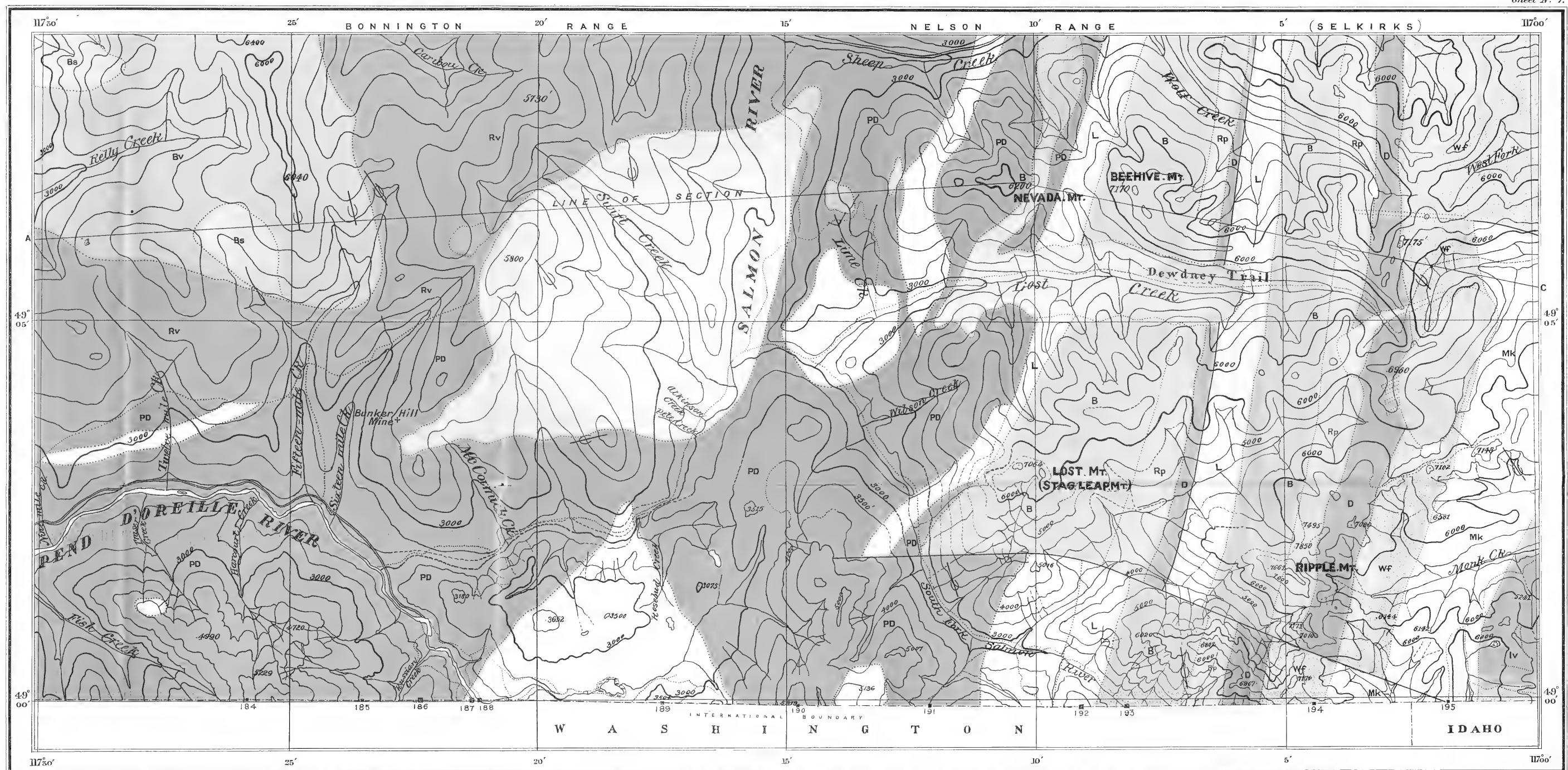
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LEGEND

CARBONIFEROUS	
<i>(?)</i> LOWER CAMBRIAN	Beaver Mountain sediments
MIDDLE CAMBRIAN	Beaver Mountain volcanics
ORDOVICIAN	Rossland volcanic formation flows and pyroclastic deposits of quartz andesite and basalt
CARBONIFEROUS	Pend D'Orville limestone white to bluish, massive marbles
CRETAEOUS	Pend D'Orville schist carbonaceous phyllite with mica-schist and amphibolite intercalations
TERTIARY	Lone Star formation dark grey, carbonaceous phyllite, with quartz schist and quartzite
LOWER CAMBRIAN	Beehive formation banded quartzite, with thin interbeds of metagabbro
BELTIAN	Ripple formation massive, white quartzite
LOWER CAMBRIAN	Dewdney formation banded quartzite, with conglomerate interbeds
W. BELTIAN	Wolf formation massive, grey grits, and arkose in very thick beds; subhorizontal sandstone
W. BELTIAN	Munk formation alternating phyllites and metamorphosed (schistose) grits, sandstones, and conglomerates; grey colours
W. BELTIAN	Irene volcanic formation thick flows of pyroxene andesites, with some pyroclastics
Intrusive	
Salmon river monzonite stock	
Granite satellite to Bayonne batholith	
Olivine syenite stock	
Symbols	
Geological boundary	
Fault	
Glacial striæ	



Topography, from surveys made by
the Boundary Commission.

Note: Somewhat numerous, though narrow dike of minette,
cutting the schists in the Pend D'Orville valley, are not shown.

Note. Localities of chemically analyzed
rocks, shown thus, + 666



GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

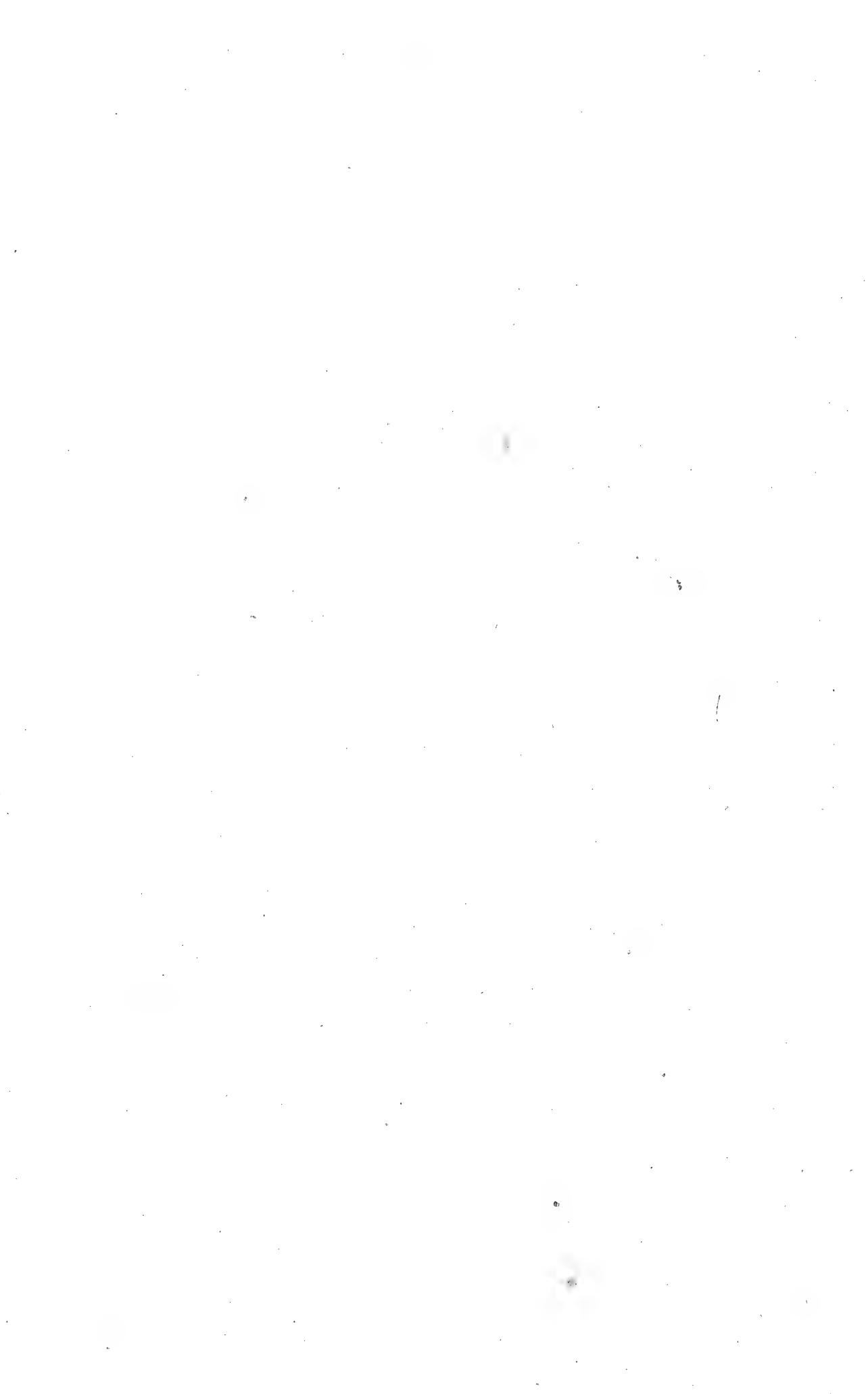
Scale: $\frac{1}{62500} = 0.9864$ Statute Miles to 1 Inch
Miles

1 2 0 1 2 3 4

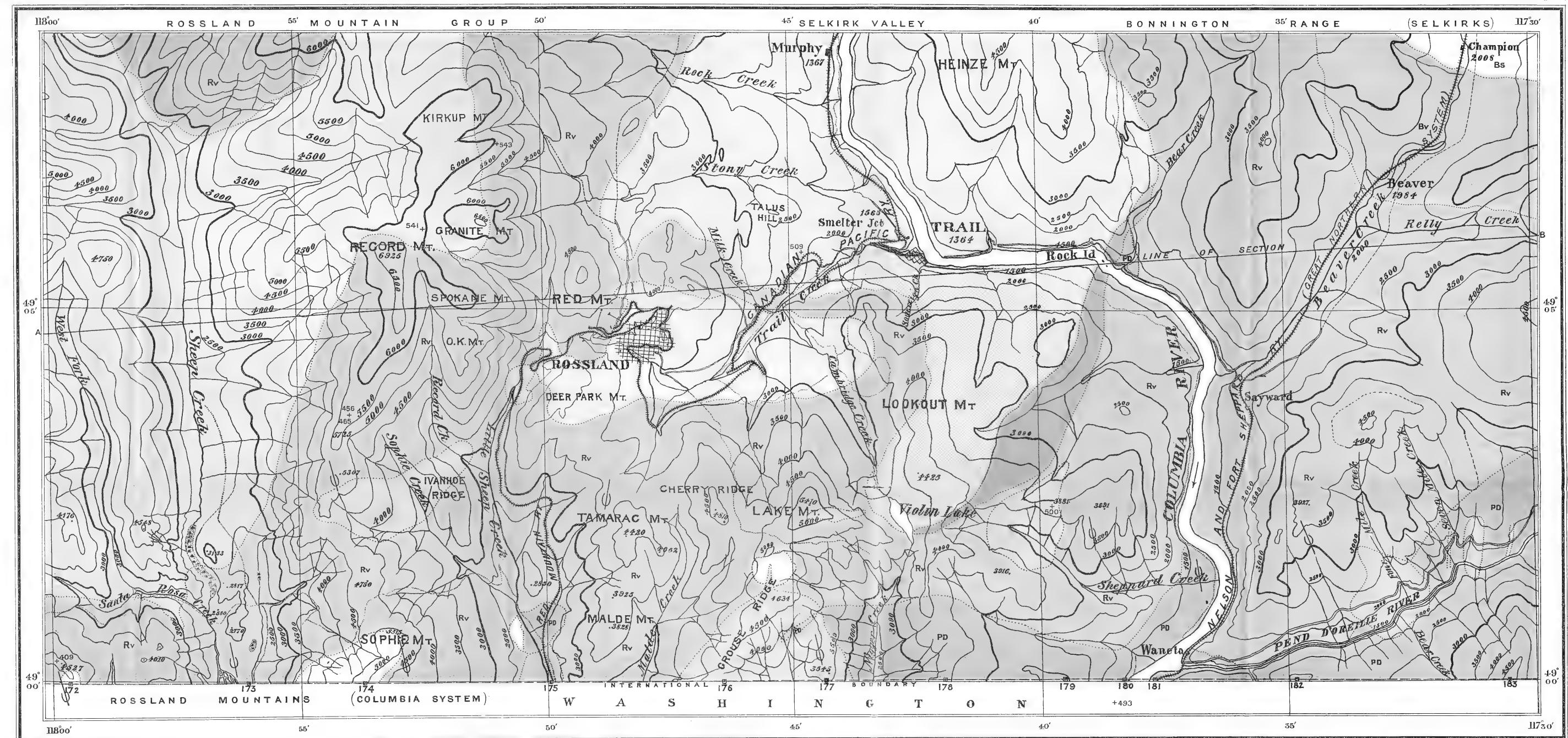
Contour interval, 500 feet

MAP 80A

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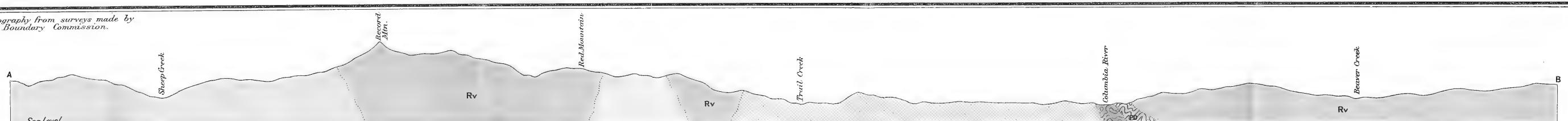






*Topography from surveys made by
the Boundary Commission.*

Note: Many minettes and other mica-lamprophyres cut the Pend Oreille schists in the Pend Oreille range, as well as the older rocks, including the mica-schists. Mica-schist bodies are syn genetic with the Rossland volcanics are not shown and apophyses dikes from batholiths and stocks are likewise not plotted. Localities of chemically analyzed rocks shown thus: +409

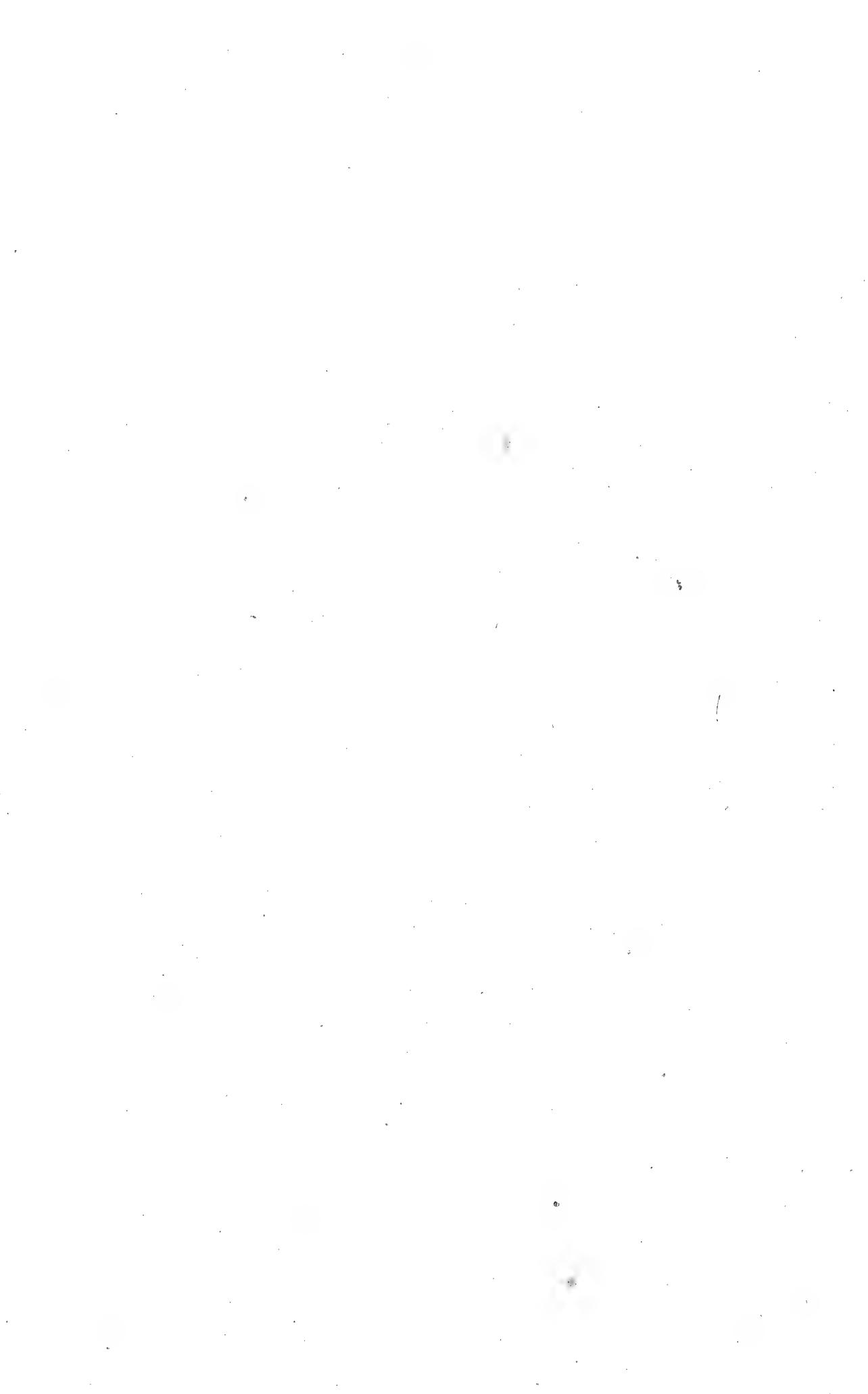


Section along line A B

Scale: $\frac{1}{62500} = 0.9864$ Statute Miles to 1 Inch.

$$\frac{1}{2}, \quad 0, \quad 1, \quad \frac{3}{2}, \quad 2, \quad \frac{5}{2}, \quad 3, \quad \frac{7}{2}, \quad 4$$

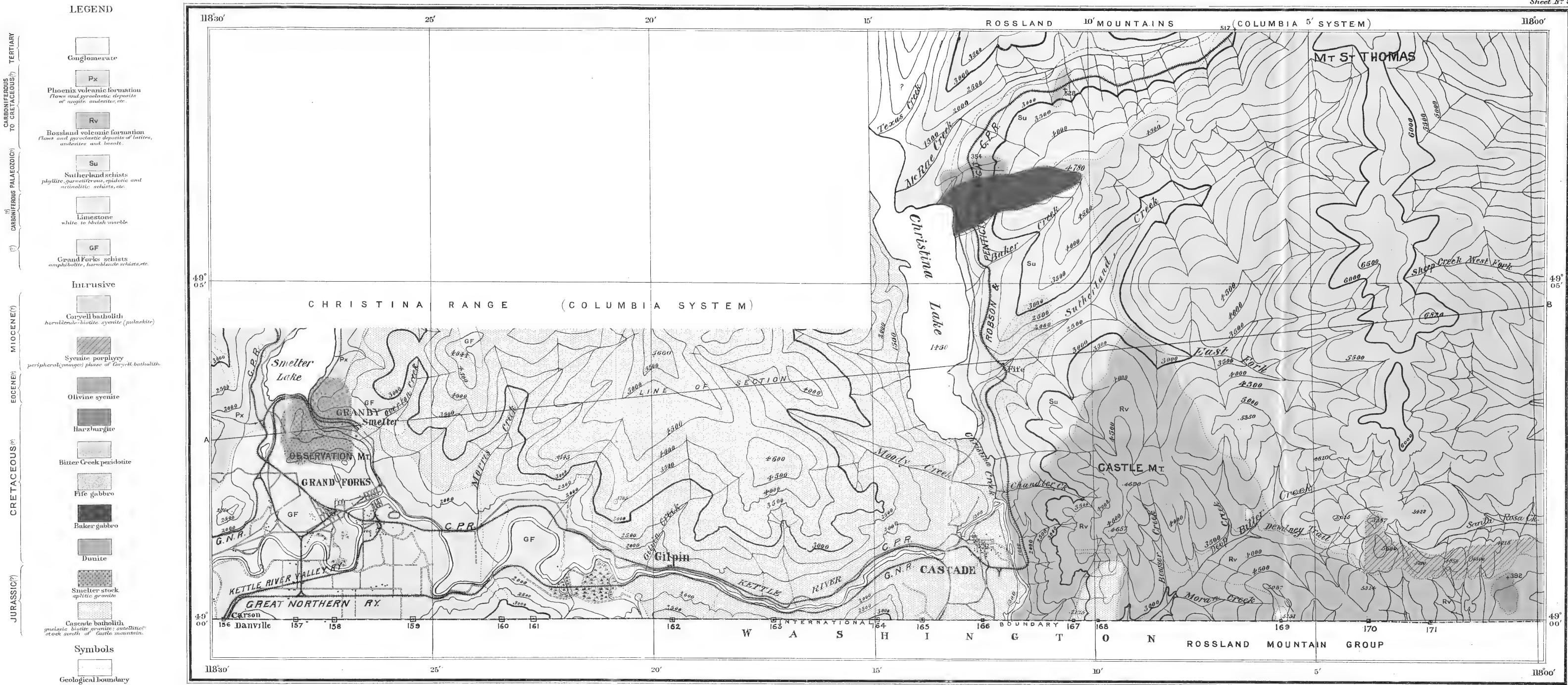
Contour interval, 500 feet.



ERRATA

Boundary Monument 156 should read 155
" 157 " 156
" 158 " 157
" 159 " 158
" 160 " 159
" 161 " 160
" 162 " 161
" 163 " 162
" 164 " 163
" 165 " 164
" 166 " a few yards east of the railway
track near Laurier.





Note. Folded structure of Sutherland and Grand Forks schists, in section, merely diagrammatic. Many apophyses of large intrusive masses not shown. Localities of chemically analyzed rocks shown thus, + 517

GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

Scale: 62500 - 09864 Statute Miles to 1 Inch
Miles

1 2 0 1 2 3 4

Contour interval, 500 feet

MAP 82A

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ERRATA

Boundary Monument 144 should be deleted
" " 145 should read 144
" " 146 " 145
" " 147 " 146
" " 148 " 147
" " 149 " 148
" " 150 " 149
" " 151 " 150
" " 152 " 151
" " 153 " 152
" " 154 " 153
" " 155 " 154



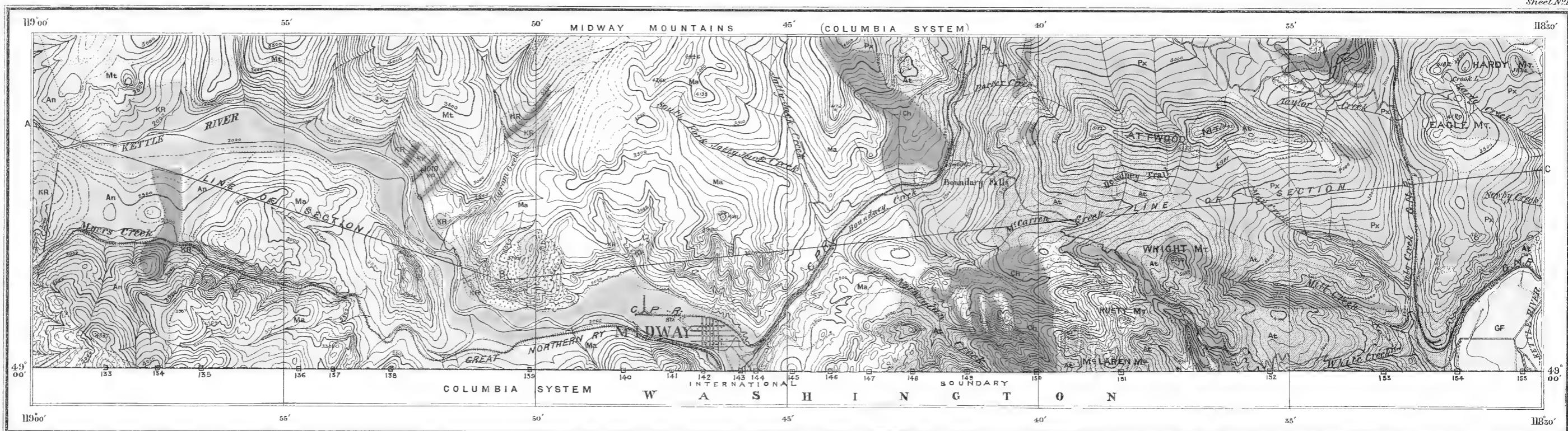
LEGEND



Note. Structures shown in schists and limestone merely diagrammatic. On account of the small scale, many dikes and intrusive sheets of porphyrites and porphyries, as well as granodiorite apophyses are not plotted. Similarly many dikes which are syngenetic

Localities of chemically analyzed rocks shown thus. + 1010

*Topography from surveys made by
the Boundary Commission.*



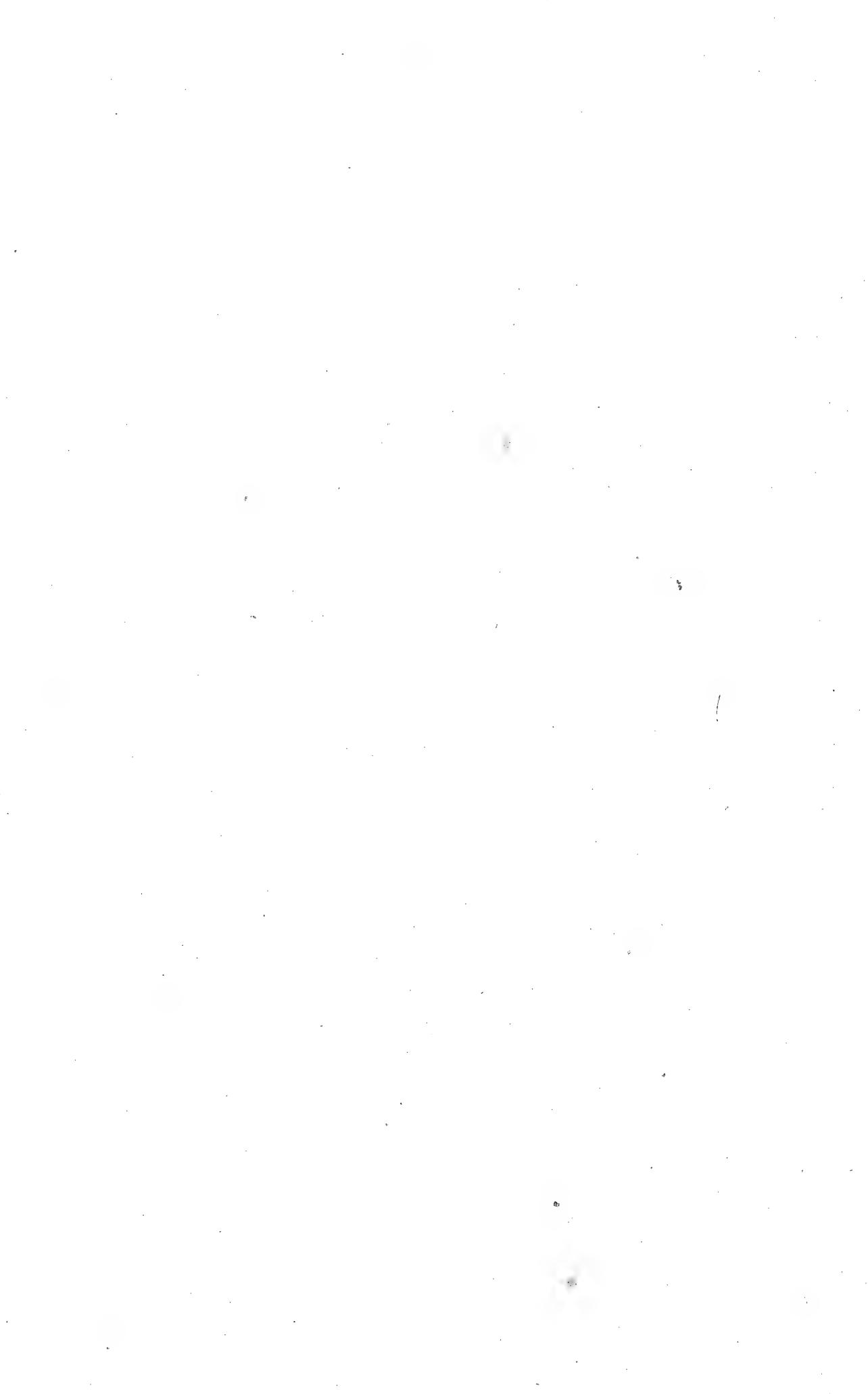
Section along line A B C
EOLGY OF THE FORTY-NINTH PARALLEL. By R. A. Daly.

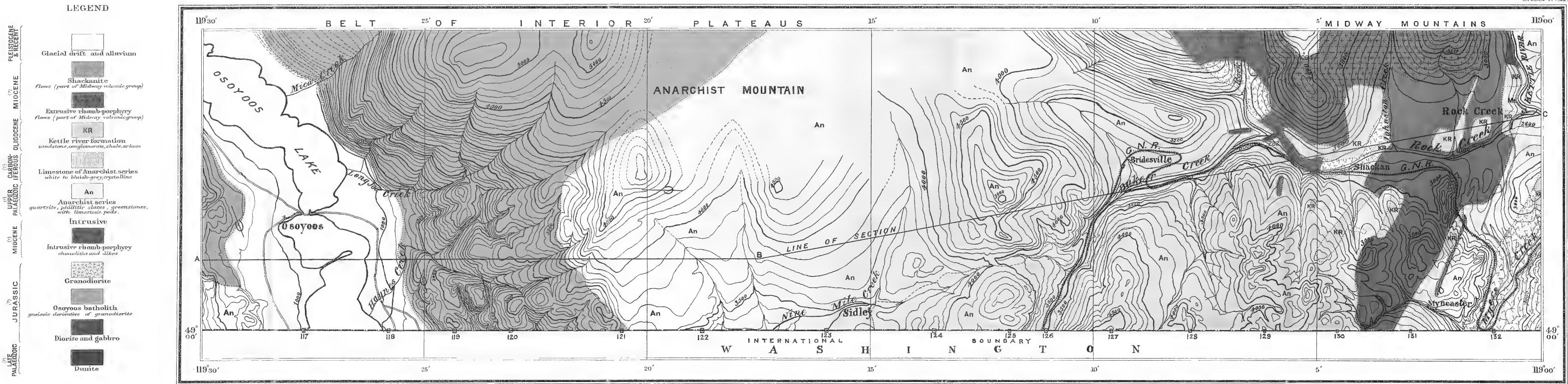
Scale: 62500 = 09864 Statute Miles to 1 Inch



Contour interval, 100 feet.

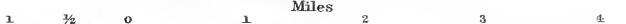






GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

Scale: 1:625000 = 0.9864 Statute Miles to 1 Inch
Miles



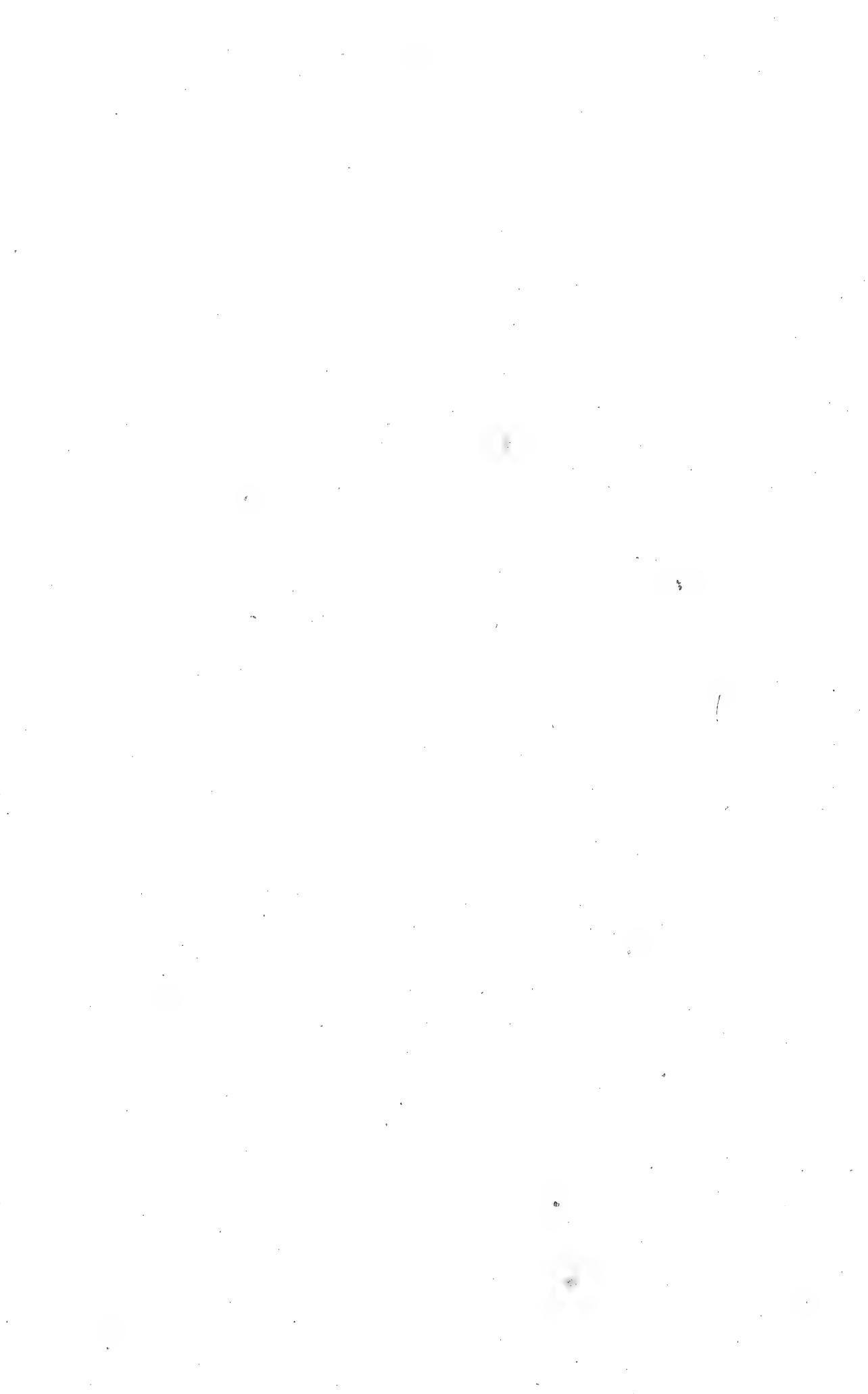
Contour interval, 100 feet

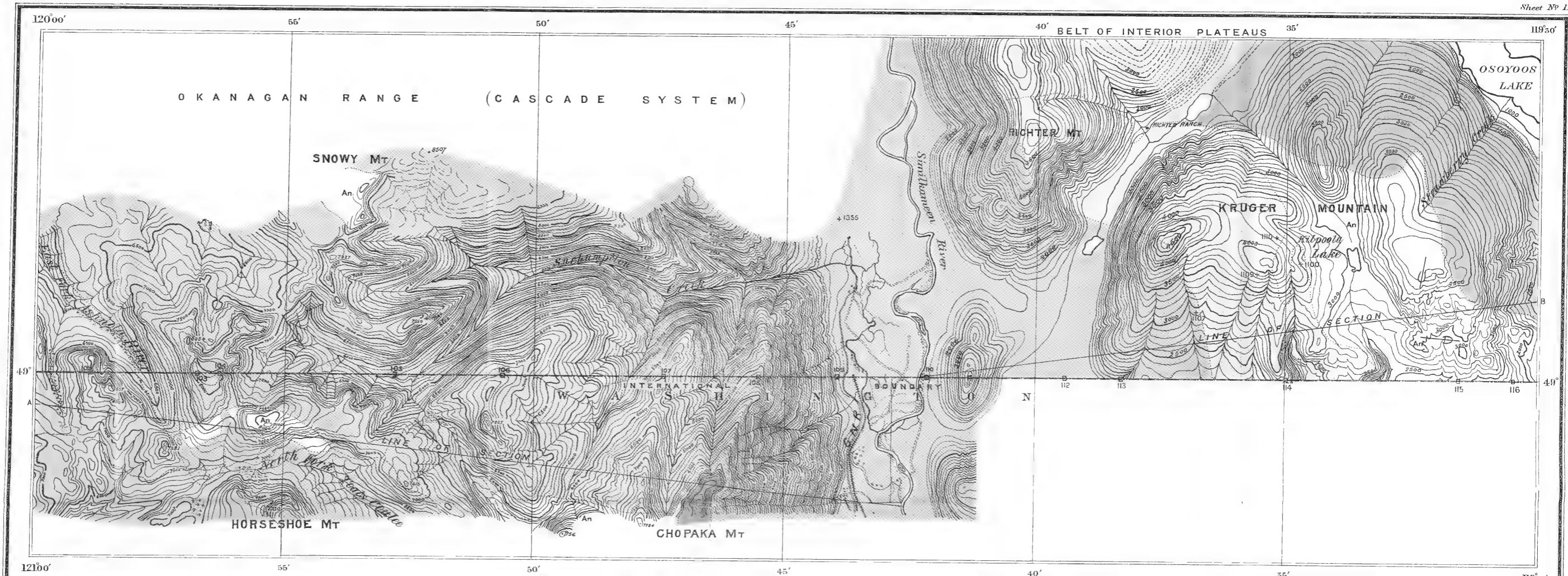
Note: Structures of Anarchist series, shown in the section, merely diagrammatic. Localities of chemically analyzed rocks, shown thus, +295

MAP 84A

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GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

Scale: $62500 = 09864$ Statute Miles to 1 Inch

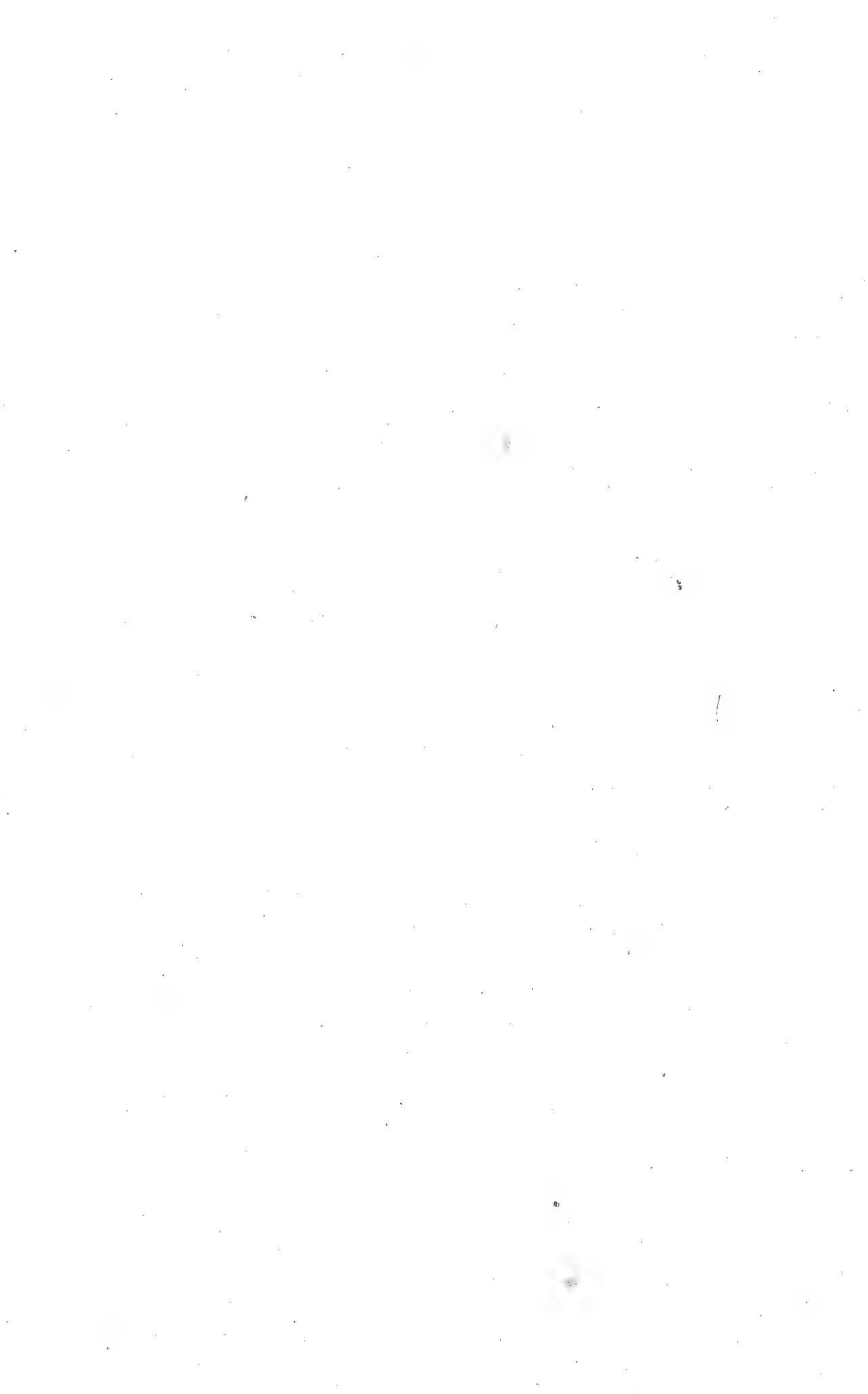
1 $\frac{1}{2}$ 0 1 2 5 $\frac{1}{2}$ Miles

Contour interval, 100 feet

MAP 85 A

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PLEISTOCENE

Vesicular dikes of basalt (Bauerman Ridge) and andesite (cutting Basic Complex)

Park granite stocks

Cathedral batholith younger phase, sialic phase

Cathedral batholith older phase, alkaline biotite granite

Agglomerate

Remmel batholith Eastern phase: highly sialic derivative of sheared granodiorite

Remmel batholith Western phase: sheared granodiorite

Ashmol gabbro

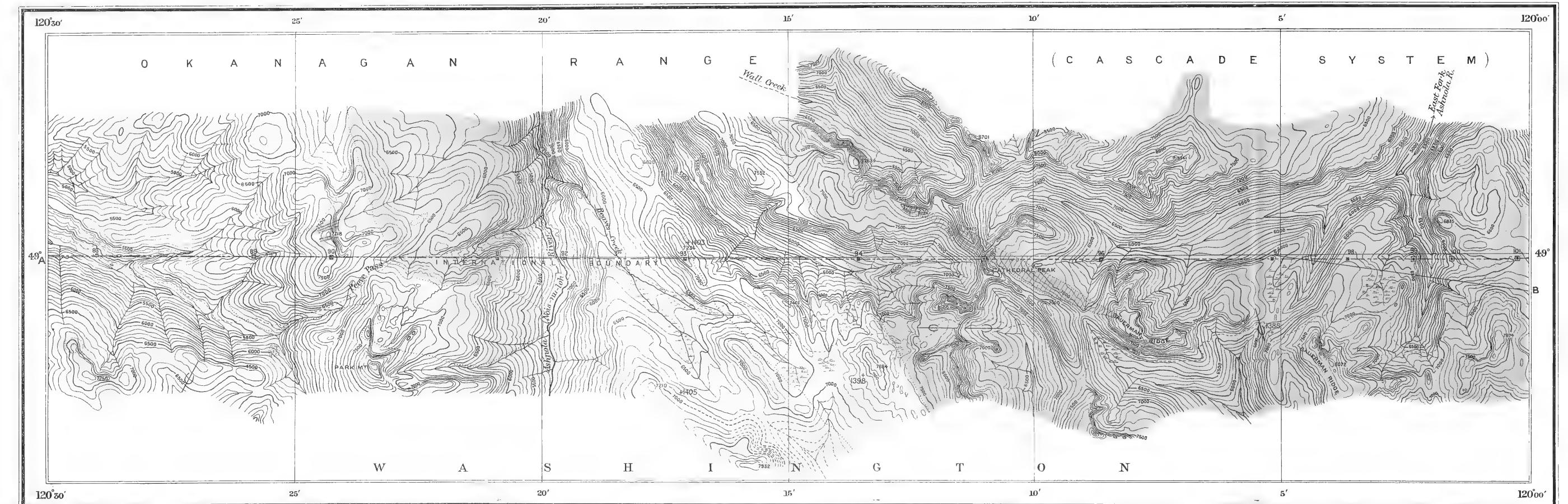
Basic complex

Symbols

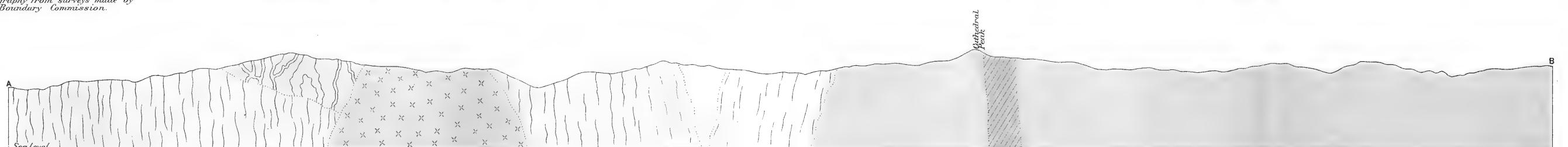
Geological boundary

Glacial striae

Note. Localities of chemically analyzed rocks, shown thus, + 1388



Topography from surveys made by the Boundary Commission.



GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

Scale: $\frac{1}{62500} = 0.9864$ Statute Miles to 1 inch

Miles

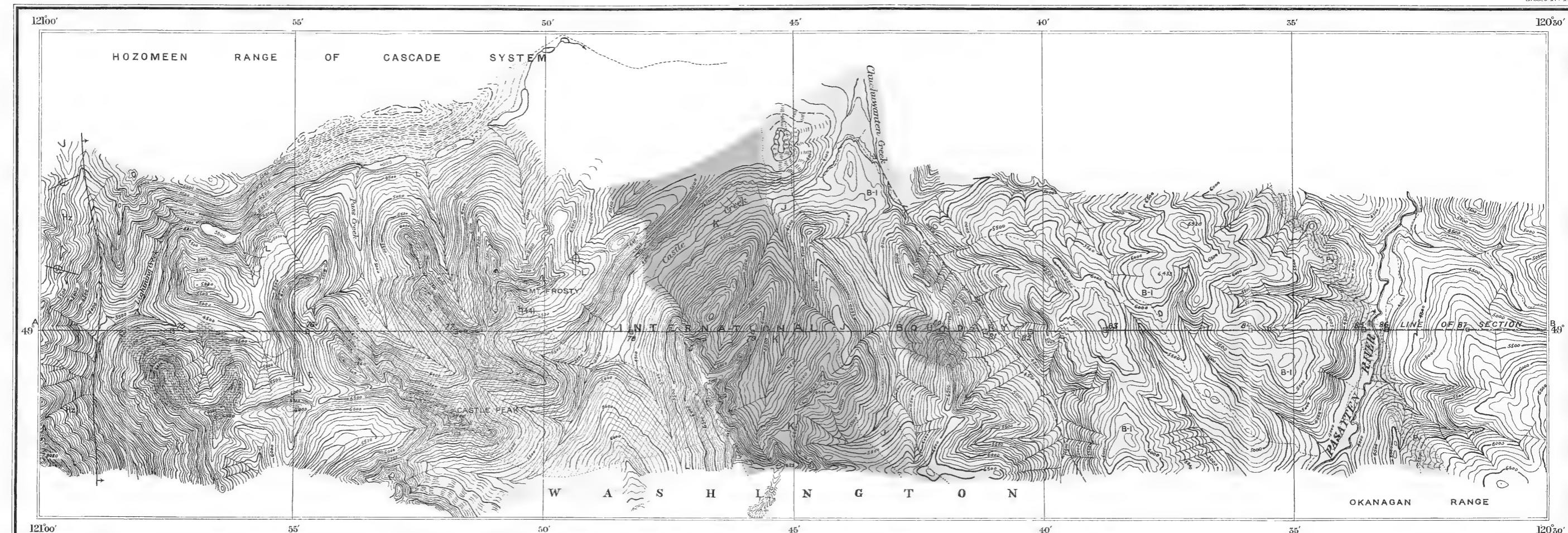
Contour interval, 100 feet

MAP 86A

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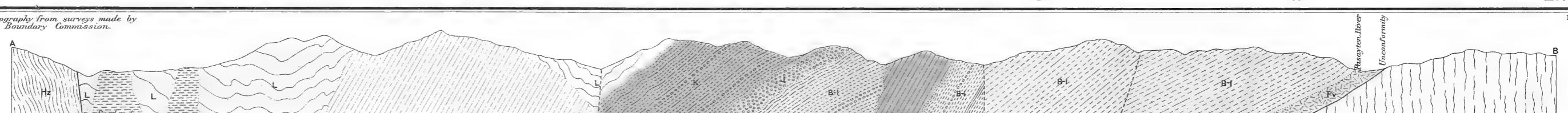






*Topography from surveys made by
the Boundary Commission.*

Note. Structure of Horomeen series, shown in section, merely diagrammatic.
Localities of chemically analyzed rocks shown thus: H^{M}



Section along line AB

Scale: $\frac{1}{25000}$ = 0.9864 Statute Miles to 1 In.

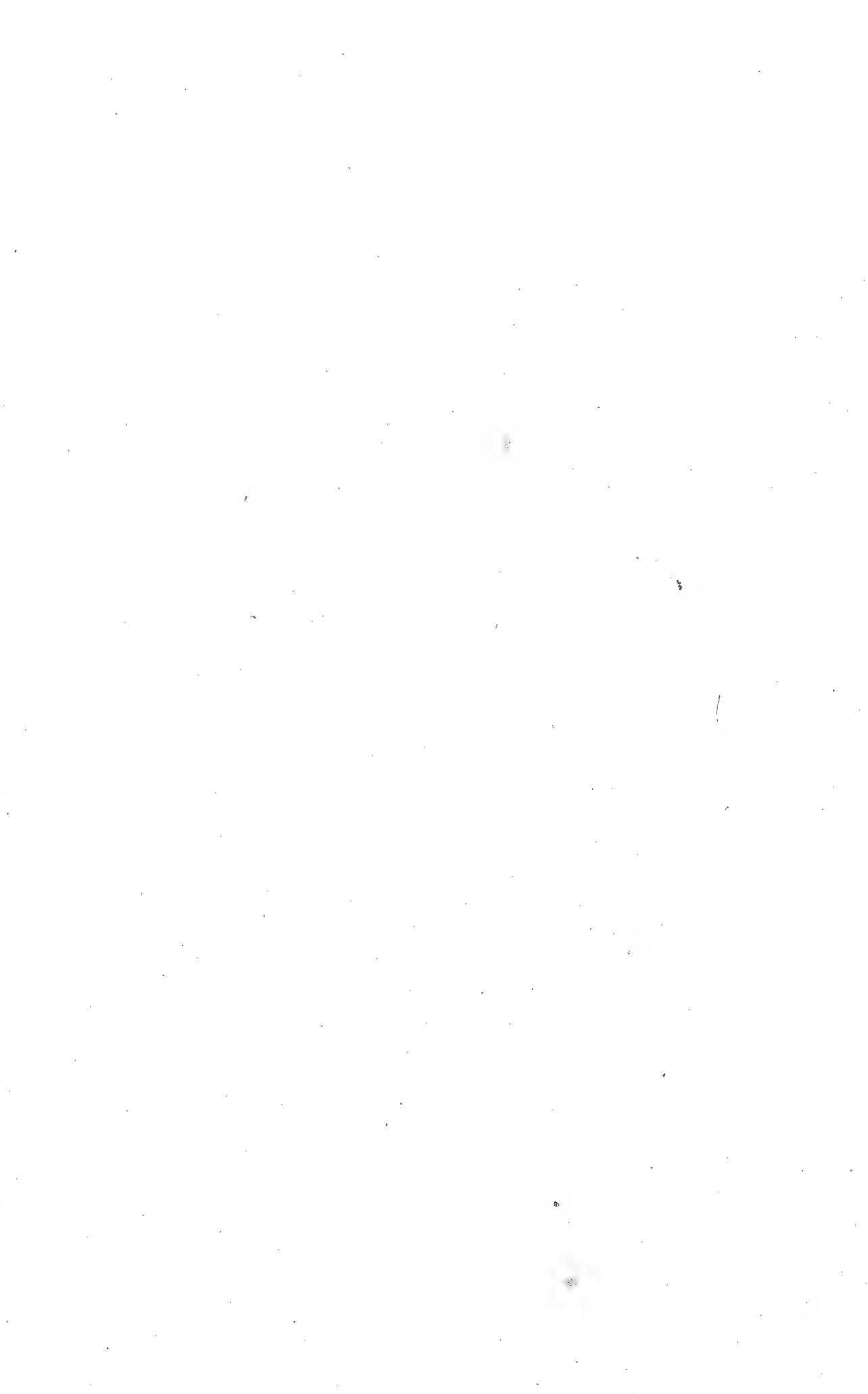
Scale 62500 0 1 2 3 4 Miles

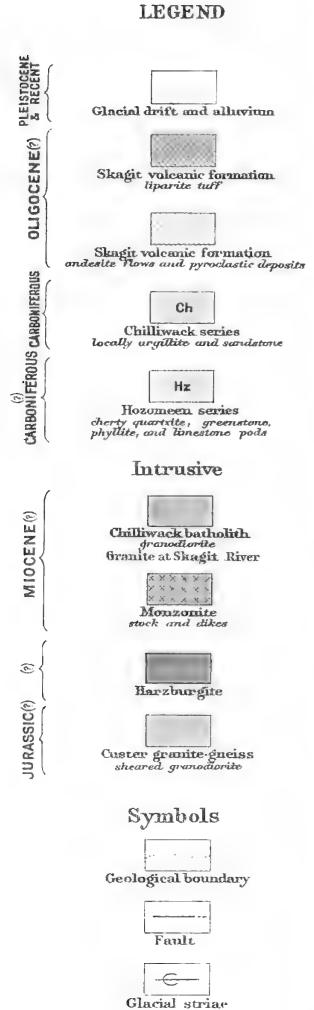


SHEET 15. SKAGIT RANGE

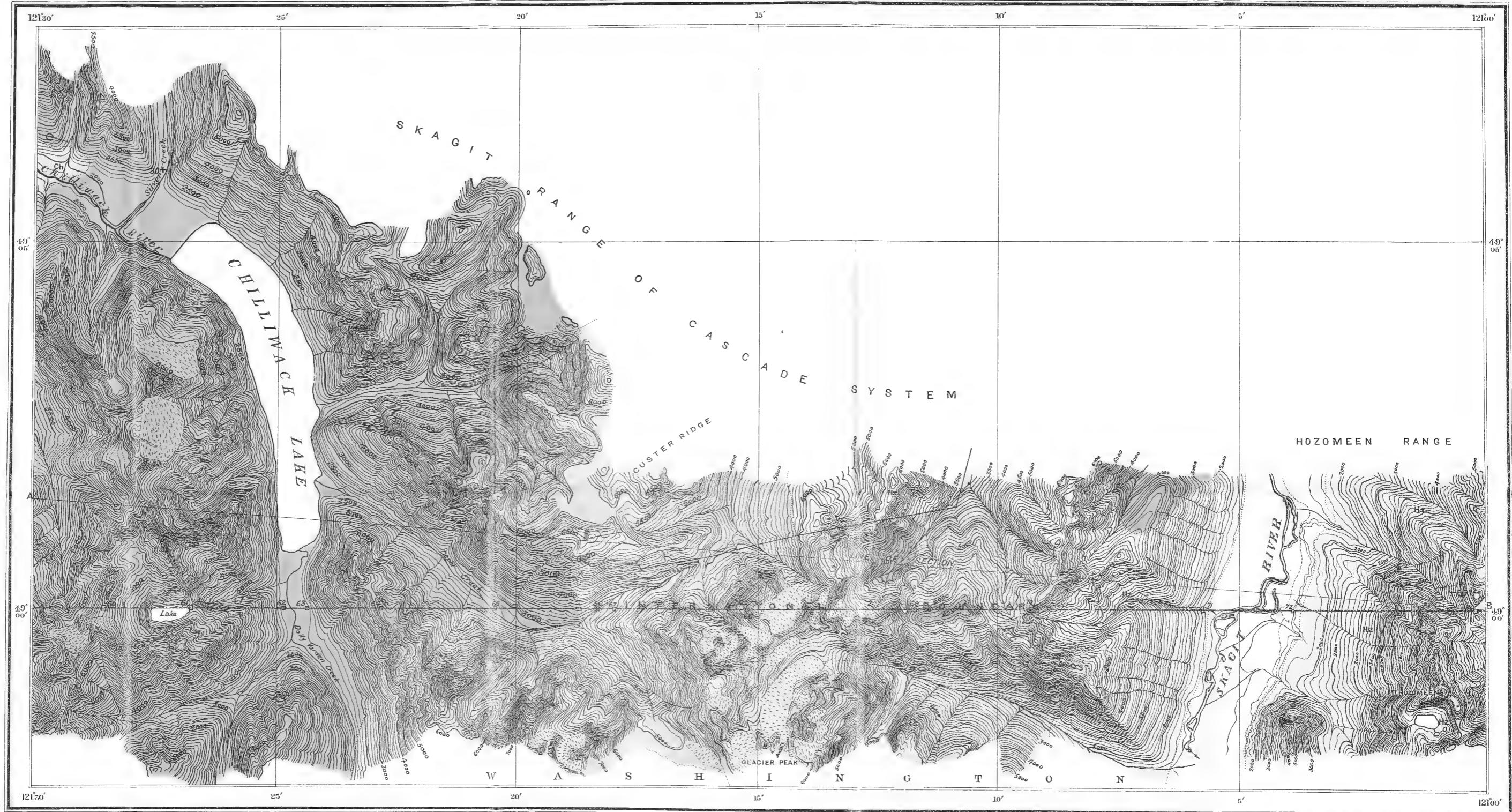
ERRATUM

Boundary Monument 59 is 1.02 miles west of Mon. 60





Note. Structure of Hozomeen series shown on section, merely diagrammatic.
Localities of chemically analyzed rocks, shown thus, +7



Topography from surveys made by
the Boundary Commission.



GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

Scale: $\frac{1}{2500}$ - 0.9864 Statute Miles to 1 Inch

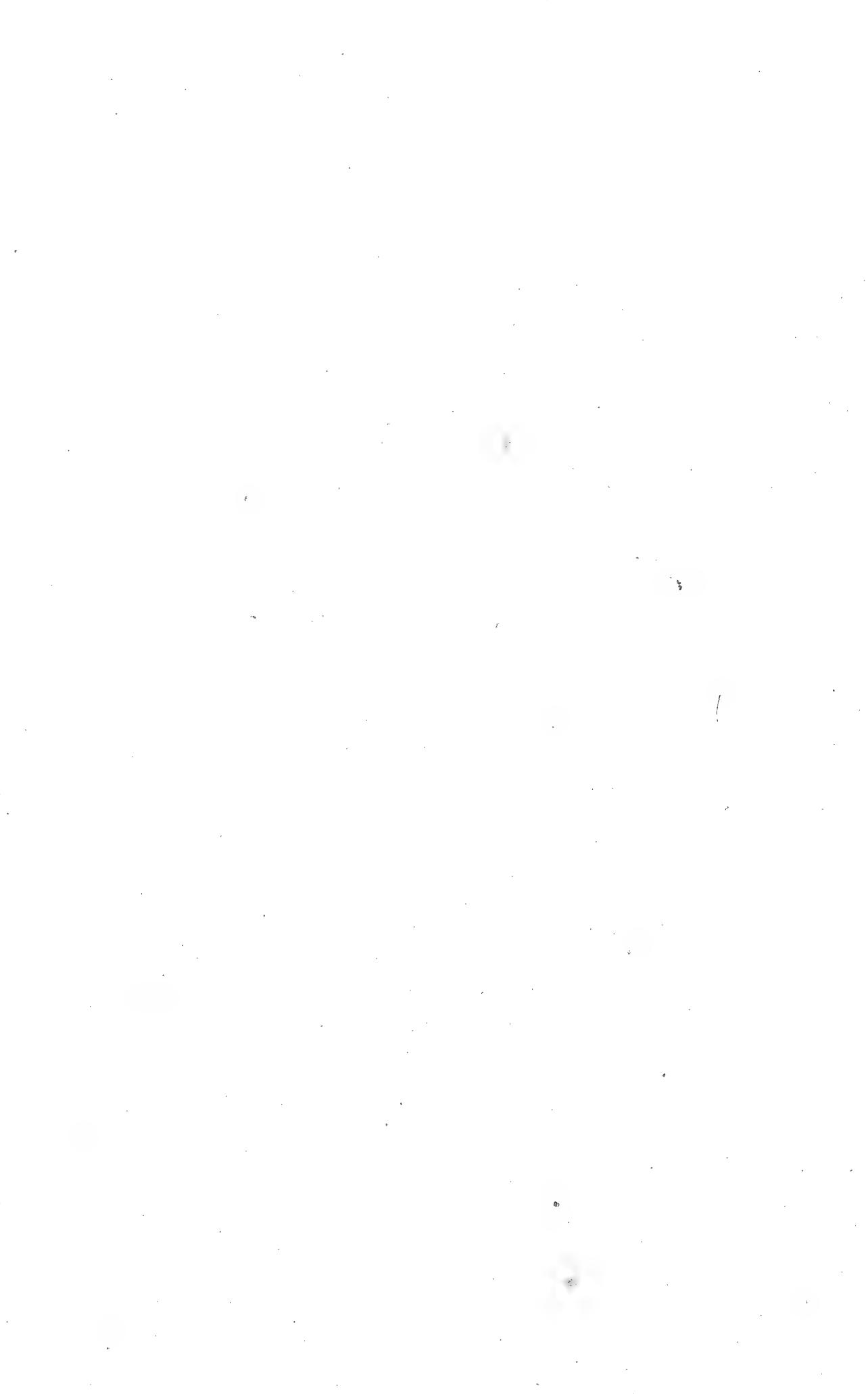
1 2 3 4 Miles

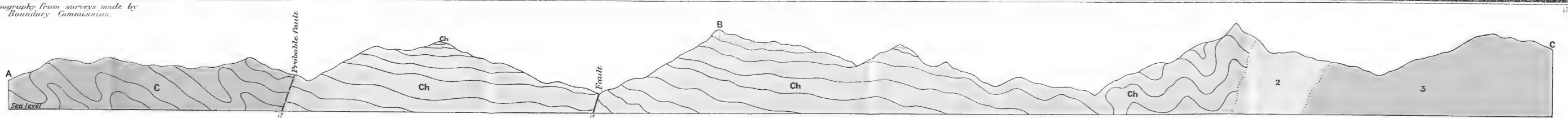
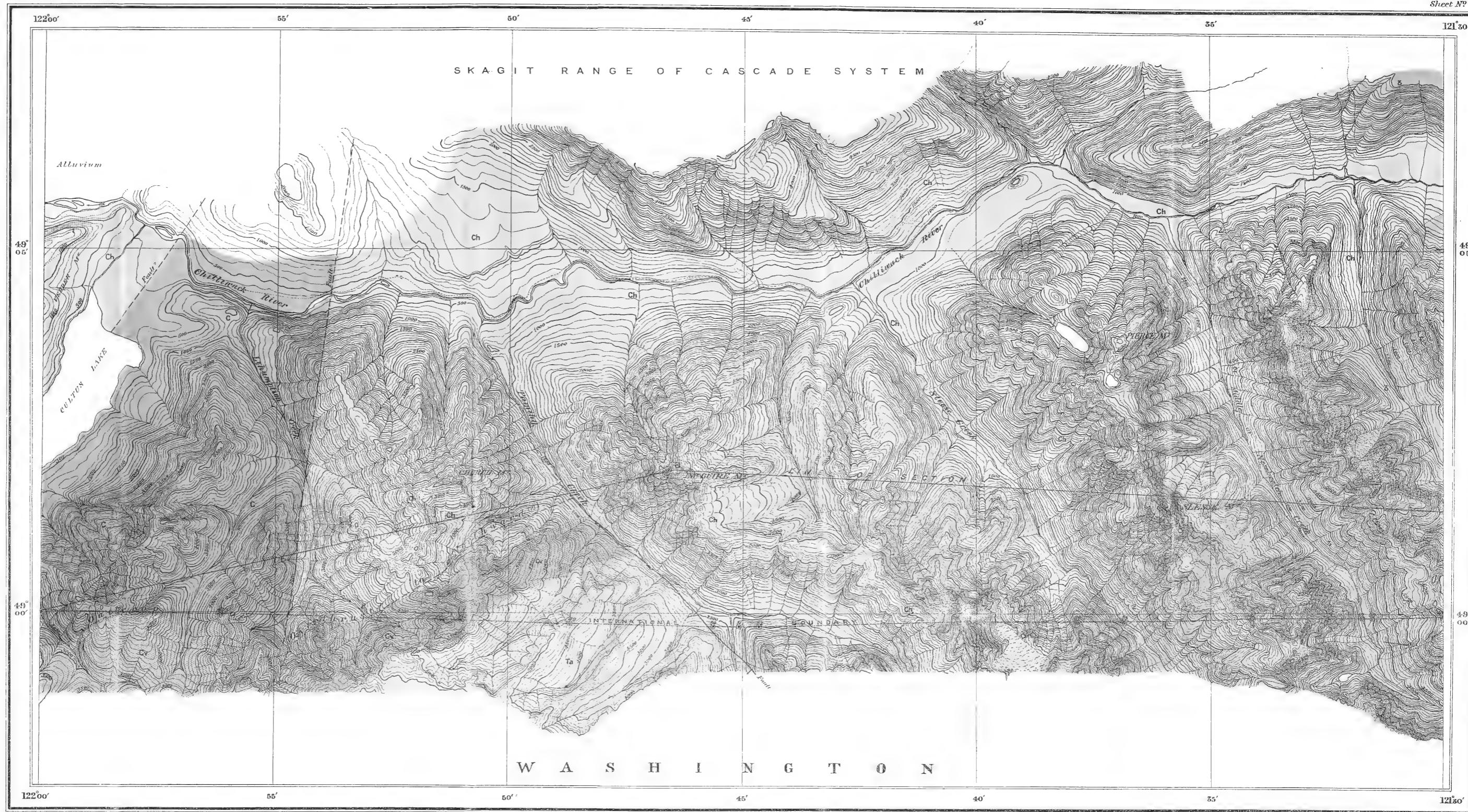
Contour interval, 100 feet

MAP 88A

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to accompany Geological Survey Memoir N^o 38







GEOLOGY OF THE FORTY-NINTH PARALLEL, By R.A.Daly.

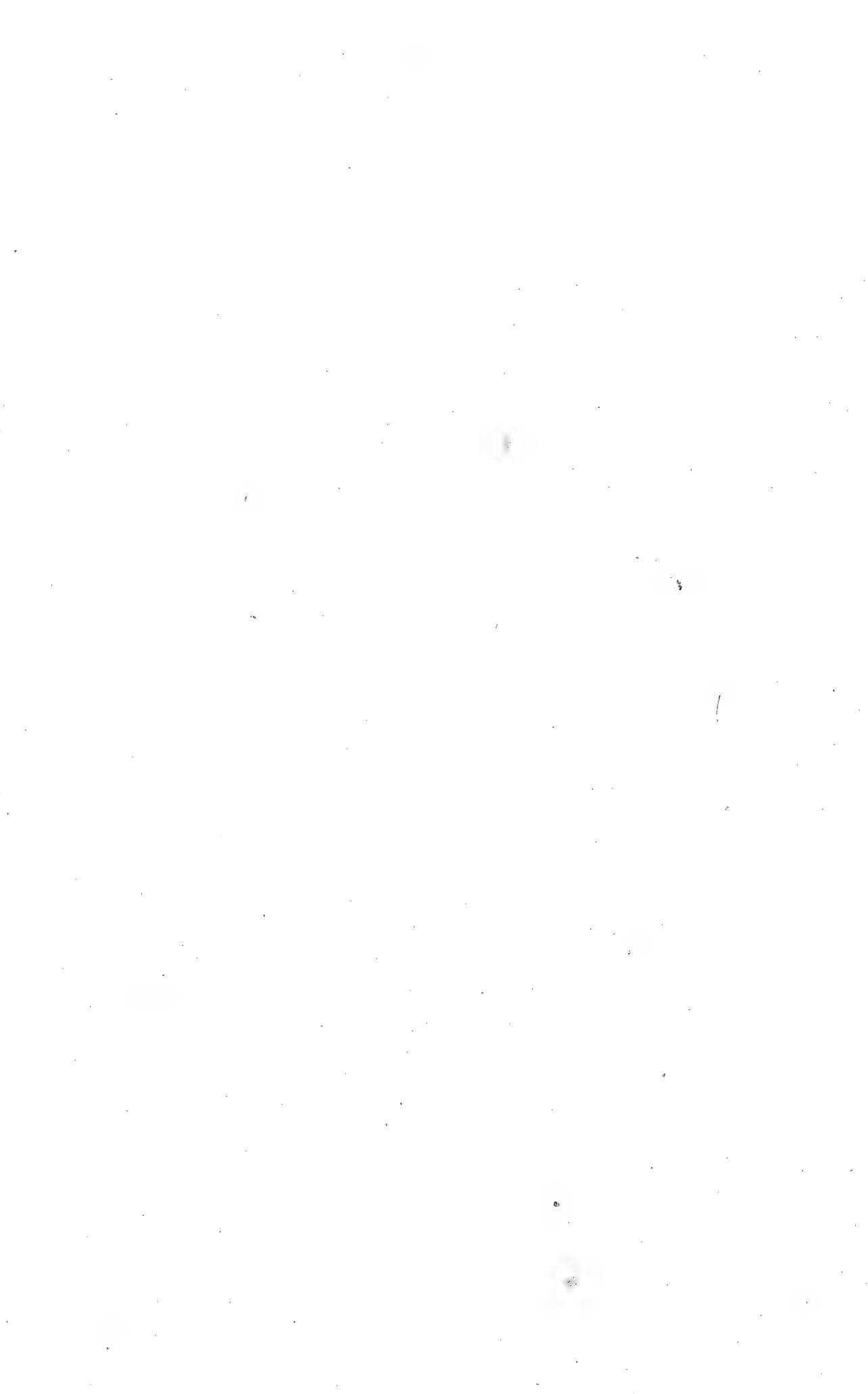
Scale: 62500-09864 Statute Miles to 1 Inch

1 2 0 1 Miles 2 3 4

Contour interval, 100 feet

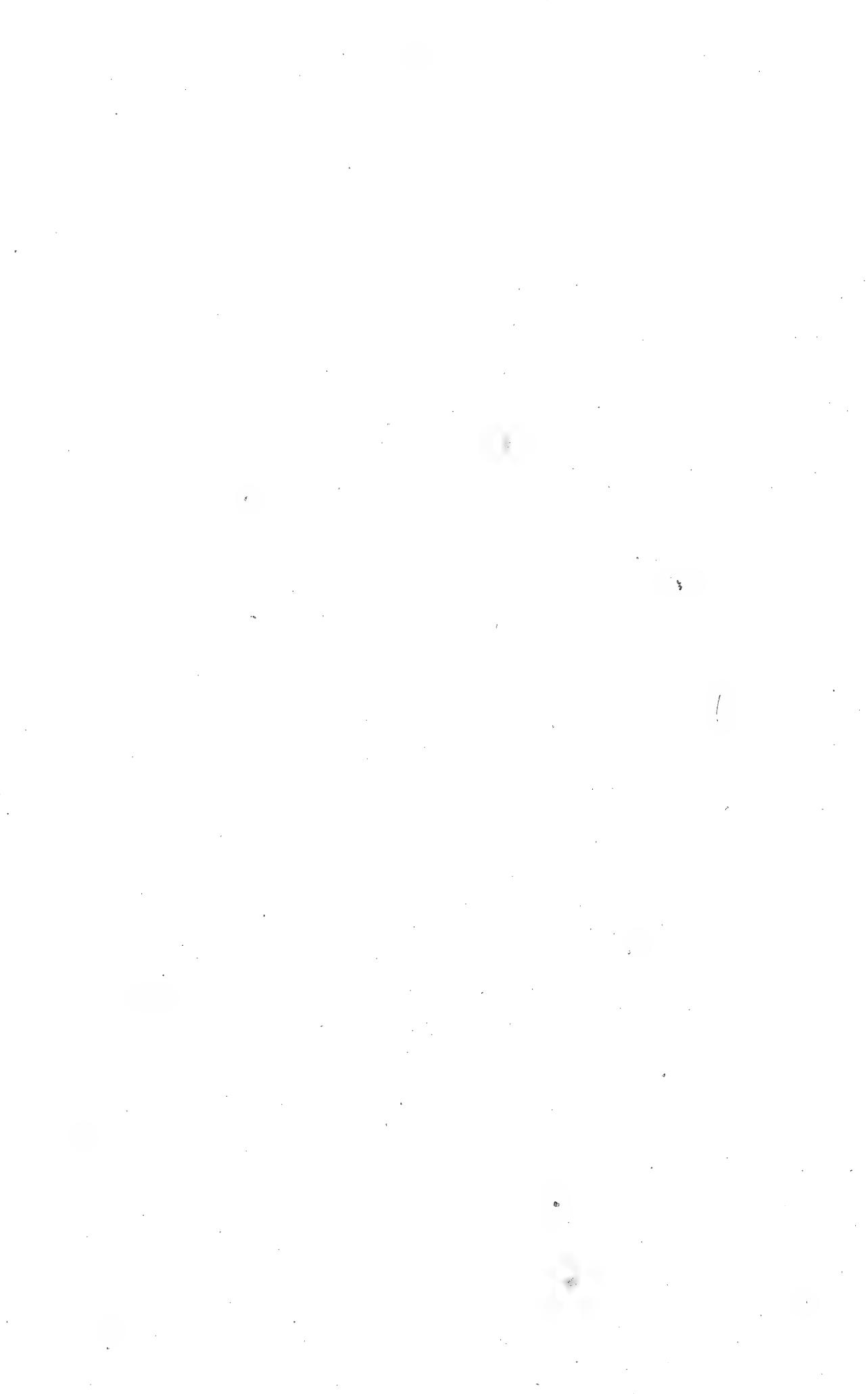
MAP 89A

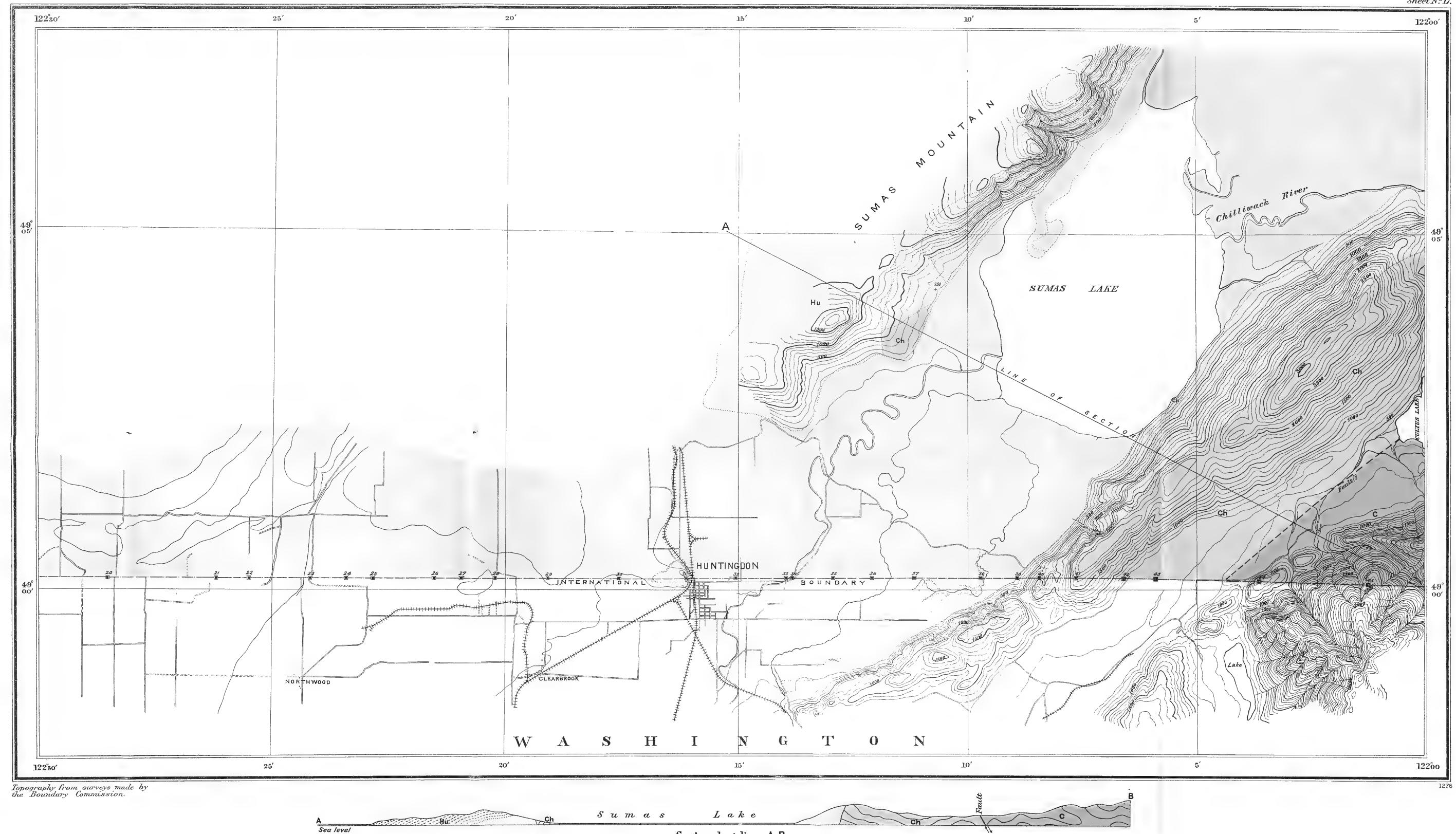
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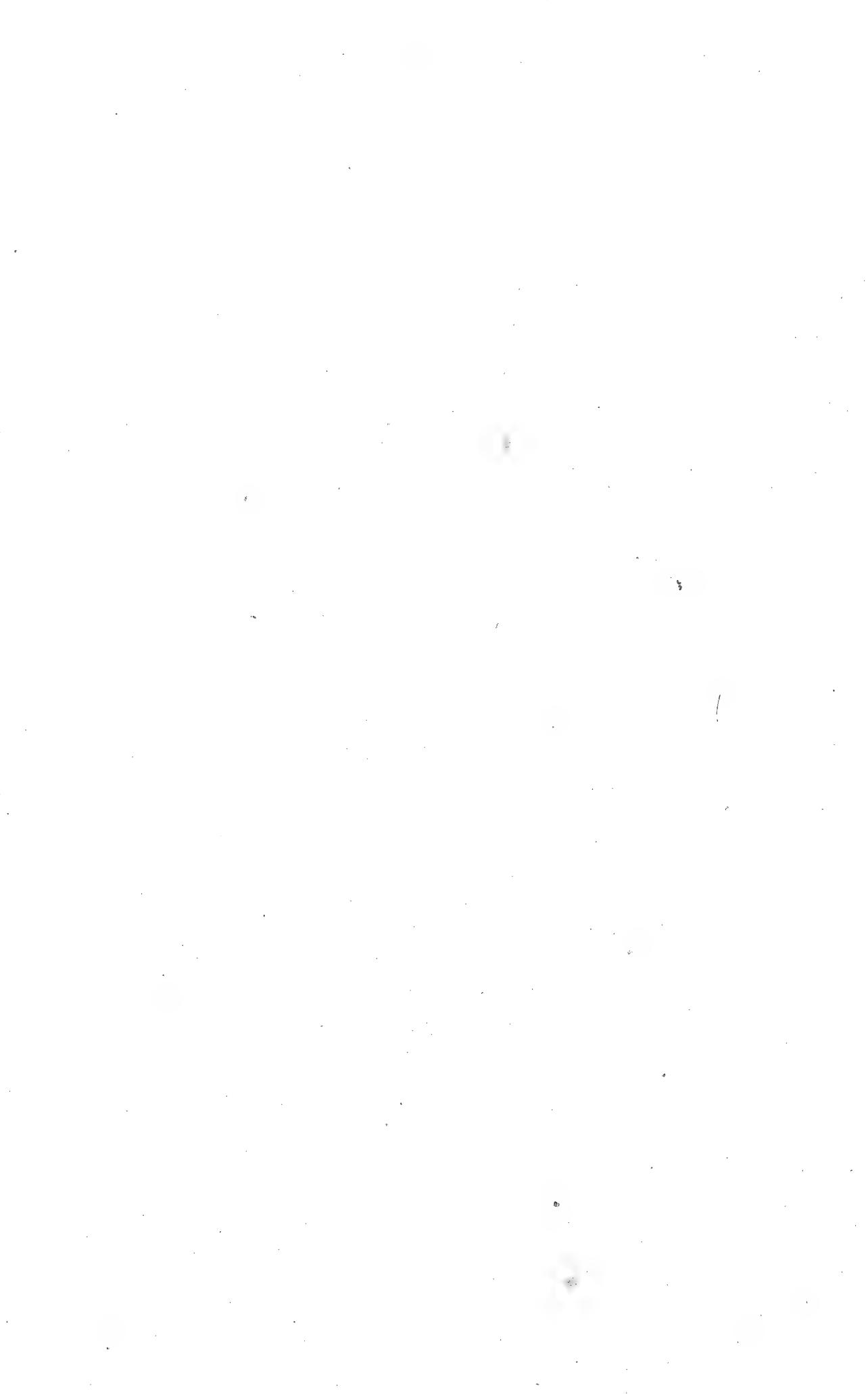


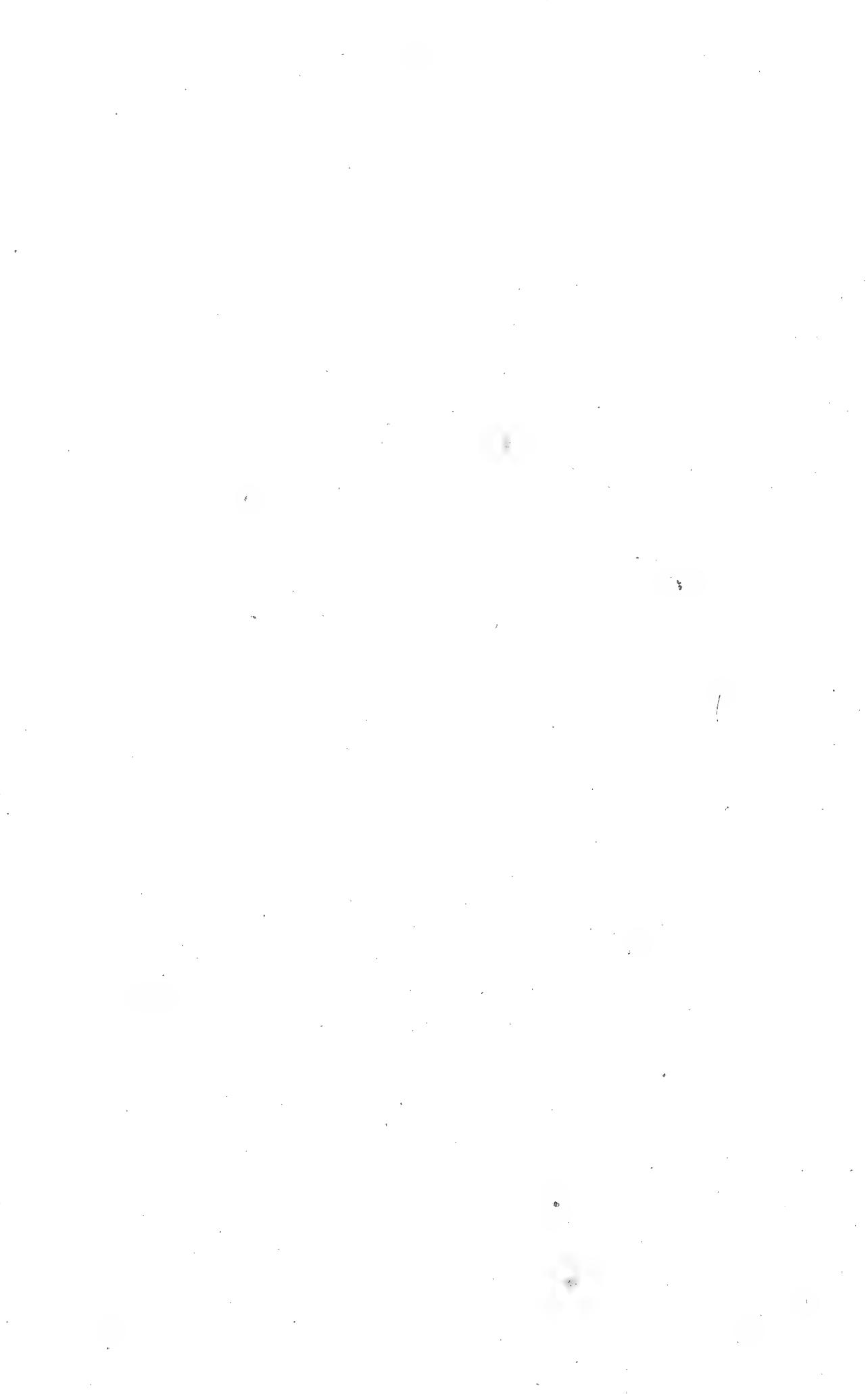
SHEET 17. SUMAS LAKE

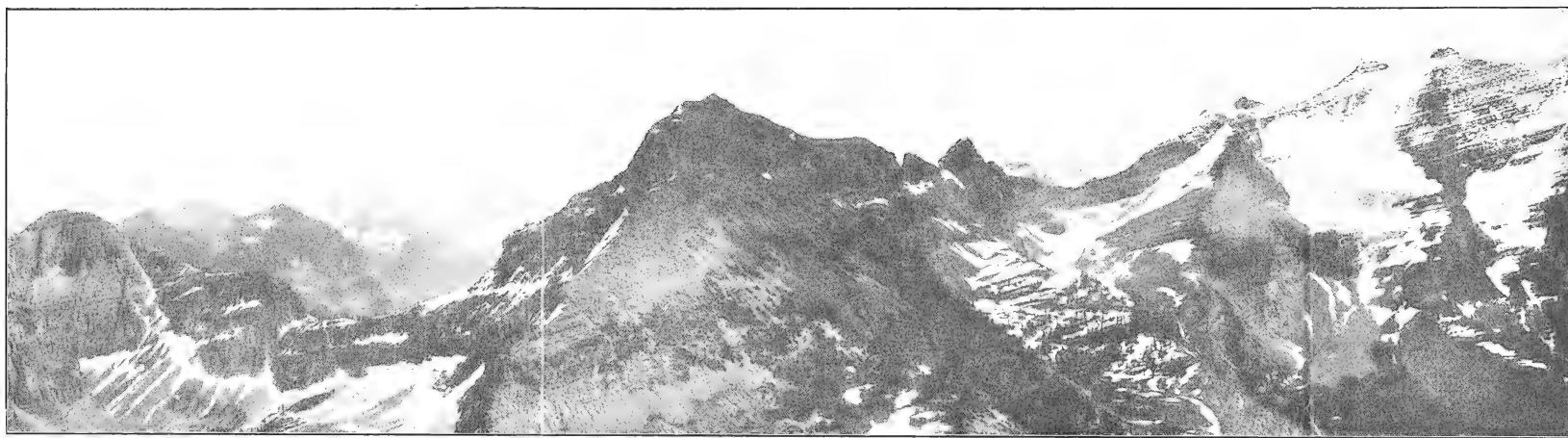
ERRATUM
Boundary Monument 19 is 0.94 miles west of Mon. 20







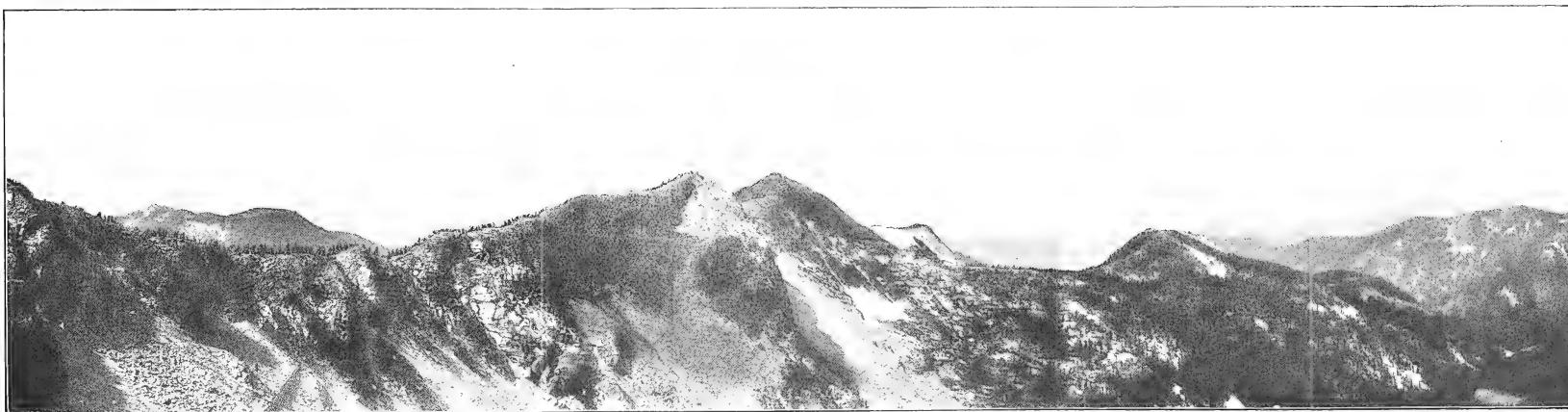




Typical view in the Clarke range. Looking eastward from head of Starvation Creek. The slope in middle of view is composed of the Siyeh formation capped by the Purcell Lava which is overlain by the Kinla formation.

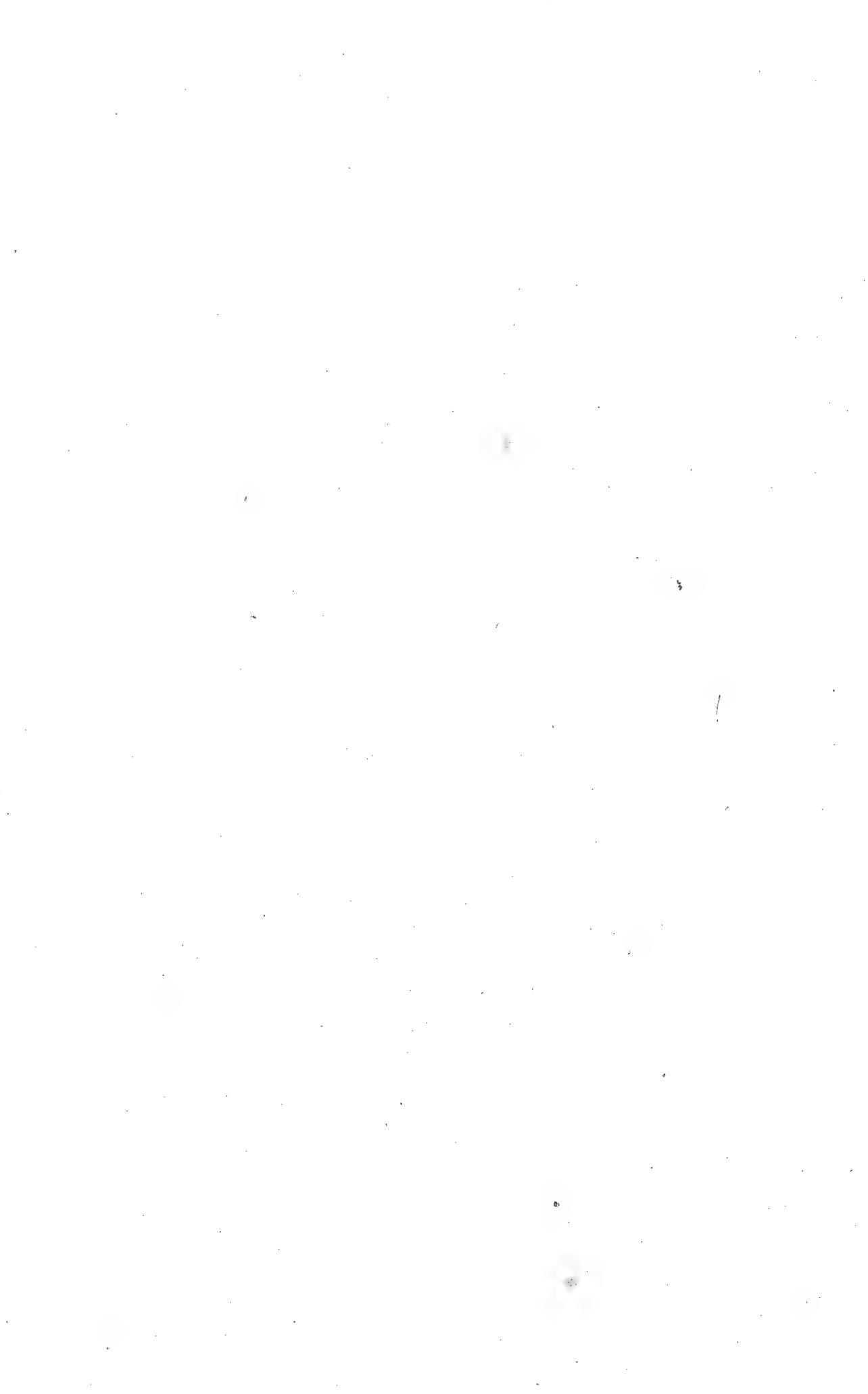


Summit of the Nelson range (Selkirk system). Looking north from a point a half-mile south of the Dewdney trail. Beehive Mountain distant, on the left.

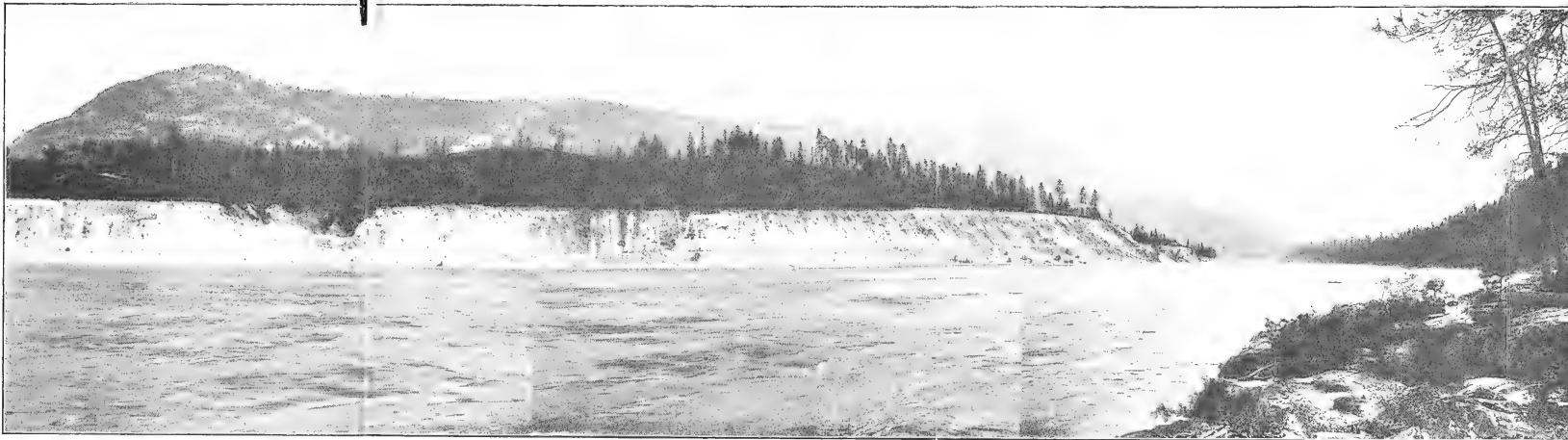


Nelson range, looking west from summit ridge north of Dewdney trail. Ridges of near distance composed of vertical quartzites, etc., of the Summit series.

(In pocket.)







Columbia River terrace and the Pend D'Oreille mountains (Selkirk system). Looking south west from near International Boundary.



Typical view in the Midway Mountains. Looking northeastwardly across Kettle River near bridge six miles above Midway.



Typical view in the Skagit range. Looking east from divide between Middle and Slesse creeks. Chilliwack River valley on the left. View shows accordance of summit levels.

(In pocket.)



ERRATA
Appendix 6.
Report of the Chief Astronomer 1910
Part III—maps

Sheet 17.—Boundary Monument 19 is 0.94 miles west of Mon. 20
 " 15—" " 59 is 1.02 " " 60
 " 10—" " 144 should be deleted
 " " 145 should read 144
 " " 146 " " 145
 " " 147 " " 146
 " " 148 " " 147
 " " 149 " " 148
 " " 150 " " 149
 " " 151 " " 150
 " " 152 " " 151
 " " 153 " " 152
 " " 154 " " 153
 " " 155 " " 154
 " " 156 " " 155
 " " 157 " " 156
 " " 158 " " 157
 " " 159 " " 158
 " " 160 " " 159
 " " 161 " " 160
 " " 162 " " 161
 " " 163 " " 162
 " " 164 " " 163
 " " 165 " " 164
 " " 165 is a few yards east of the railway track **near Laurier**.
 " " 207 is 2.72 miles west of Mon. 208
 " " 207 should read 208
 " " 208 " " 209
 " " 209 " " 210
 " " 210 " " 211
 " " 211 " " 212
 " " 212 " " 213
 " " 213 " " 214
 " " 214 " " 215
 " " 215 " " 216
 " " 216 " " 217
 " " 218 is 0.02 miles east of Mon. 217
 " " 217 should read 219
 " " 219 " " 220
 " " 220 " " 221
 " " 221 " " 222
 " " 222 " " 223
 " " 223 " " 224
 " " 224 " " 225
 " " 225 " " 226
 " " 226 " " 227

Sheet 4.—Boundary Monument 226 should read 228
 (continued)
 " " 227 " " 229
 " " 228 " " 230
 " " 229 " " 231
 " " 230 " " 232
 " " 231 " " 233
 " " 232 " " 234
 " " 233 " " 235
 " " 234 " " 236
 " " 235 " " 237
 " " 236 " " 238
 " " 237 " " 239
 " " 238 " " 240
 " " 239 " " 241
 " " 240 " " 242
 " " 241 " " 243
 " " 244 is 0.22 miles west of Mon. 245
 " " 242 should read 245
 " " 243 " " 246
 " " 244 " " 247
 " " 245 " " 248
 " " 246 " " 249
 " " 247 " " 250
 " " 248 " " 251
 " " 252 is 1.35 miles east of Mon. 251
 " " 249 should read 253
 " " 250 " " 254
 " " 251 " " 255
 " " 252 " " 256
 " " 257 is 2.59 miles east of Mon. 256
 " " 253 should read 258
 " " 259 is 2.14 miles east of Mon. 258
 " " 254 should read 260
 " " 255 " " 261
 " " 256 " " 262
 " " 257 " " 263
 " " 258 " " 264
 " " 259 " " 265
 " " 260 " " 266
 " " 261 " " 267
 " " 262 " " 268
 " " 269 is 0.94 miles west of Mon. 270
 " " 263 should read 270
 " " 264 " " 271
 " " 265 " " 272
 " " 273 is 1.16 miles east of Mon. 272

Sheet 5.—
 " " 207 is 2.72 miles west of Mon. 208
 " " 207 should read 208
 " " 208 " " 209
 " " 209 " " 210
 " " 210 " " 211
 " " 211 " " 212
 " " 212 " " 213
 " " 213 " " 214
 " " 214 " " 215
 " " 215 " " 216
 " " 216 " " 217
 " " 218 is 0.02 miles east of Mon. 217
 " " 217 should read 219
 " " 219 " " 220
 " " 220 " " 221
 " " 221 " " 222
 " " 222 " " 223
 " " 223 " " 224
 " " 224 " " 225
 " " 225 " " 226
 " " 226 " " 227

Sheet 2.—
Sheet 3.—

Sheet 4.—



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